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ABSTRACT

This unit, one of six which comprise the Fair Play program, teaches students to use data analysis skills to examine sex differences in career choices, mathematics attitudes, and treatment in the labor force. The Fair Play program is a series of student and teacher materials the purpose of which is to help students expand their female or male self-concepts, increase their decision-making skills, and improve their academic achievement by changing their stereotypic attitudes toward particular content areas. This student guide contain 18 lessons organized into three parts: (1) differential treatment and attitudes of males and females in relation to mathematics and mathematics-oriented careers; (2) application of data analysis skills to male and female economic issues; and (3) consideration of personal career options and mathematics attitudes. The lessons include learning activities for individuals and groups, discussion items, and evaluation exercises. (DC)

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Fair Play: Developing Self-Concept
and Decision-Making Skills
in the Middle School

Decisions about Mathematics

Student Guide

Byron G. Massialas
Project Director

Florida State University

Women's Educational Equity Act Program
U.S. Department of Education
T. H. Bell, Secretary

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To you, the student:

What is your attitude toward mathematics?

Do you think math is only for geniuses? Do you enjoy using math, or are you afraid of math? Do you think math is mostly for boys? Does math fit into your future career plans?

If you have a negative attitude toward math, you are limiting your choices. For example, many girls think math is for boys, so they don't work to be successful in math. As a result, later in life, these girls are often limited to a small number of job choices.

In this unit, you will have an opportunity to rediscover math. You will use math to collect information about yourself, your friends, and your family. You will find out the importance of math in preparing both girls and boys for many different careers.

In the final part of the unit, you will have a chance to use math to make decisions about your life.

Part I

Math and Money

Lesson 1: Girls and Boys in Math

Activity A: Do you like math?

Do you enjoy math? How about your classmates—which of them enjoy math? How many of them are going to take math throughout high school?

To find out the answer to these questions, first answer each question below. Answer with yes, no, or undecided. Then, your teacher will tally girls' and boys' responses.

A-1 Do you like math?

A-2 Do you get good grades in math?

A-3 Do you plan to take at least three math courses in high school?

A-4 Do you think boys are better than girls at math?

A-5 Would you seriously consider preparing for a career in math?

Look at the tally of answers in your class. Then answer the following questions.

A-6 Do more males or females enjoy math?

A-7 Do more males or females get good grades in math?

A-8 Do more males or more females plan to take at least three math courses in high school?

A-9 Do more males or more females think that boys are better than girls at math?

A-10 Do more males or more females plan to prepare for careers in math?

Activity B (discussion): Female and male attitudes toward math

B-1 Discuss possible reasons for your answers to A-6 through A-10.

B-2 Research shows that, as girls grow older, they tend to stop taking math. What do you think is the reason that girls change:

a. Because they are not good at math?

b. Because they think they won't need math—since they plan to get married and not work?

c. Because they are told math is a male subject?

B-3 What are some differences in the way boys and girls are raised? What are some differences in the courses they take? Can these differences explain why boys take math courses more often? If so, how?

Activity C:
Reasons for feelings

Form a group with three or four other students. Choose a group recorder to write your group's answers. Discuss the following questions. Then present your group's answers to the class.

C-1 In what ways are boys and girls raised differently? What activities are boys encouraged to do? What activities are girls encouraged to do?

C-2 What courses are girls encouraged to take? Are boys encouraged to take the same courses?

C-3 Look at your answers for C-1 and C-2. Can these differences determine whether someone is good at math or likes math? Explain.

C-4 What are some reasons people may enjoy math?

C-5 What are some reasons people may be afraid of math?

C-6 What people influence your attitude toward math?

Lesson 2: Females and Males Making Money

Activity A: Females and males in society

In the last lesson, you discovered differences in female and male attitudes toward math. You tried to think of reasons for these attitudes.

You probably discovered that girls and boys are often treated differently while growing up. Boys are often encouraged to play with mechanical toys, to explore the outdoors, and to take courses such as shop and mechanical drawing. Girls, on the other hand, often play with dolls and are taught things like cooking.

What about adults? Are there differences in what female and male adults like and do? Are there differences in the way female and male adults are treated by society?

In this lesson, you will think about these questions. In the following lessons, you will use mathematics to gather information about these questions.

Form a group with four or five other students. Read the questions below and discuss each one carefully. Have your group recorder write your group's answers.

A-1 In the past, our society had strict opinions about what jobs women should hold and what jobs men should hold. Give examples of these jobs.

A-2 How many years do you think adult women work outside the home—less than 10 years, 10 to 20 years, or more than 20 years?

A-3 In general, women are paid less than men. Why do you think this situation exists? (Think about these factors: amount of education, amount of math and science background, areas of study in college, sex discrimination.)

A-4 Why do many women choose not to prepare for a career? How might their choice be a mistake?

A-5 Do you think more jobs or fewer jobs in the future will require math backgrounds? Explain.

A-6 Think of jobs that require math skills. List the jobs. Are they generally high-paying or low-paying? Are they held mostly by men or by women?

Activity B: Class wrap-up

Discuss your answers for Activity A.

Part II

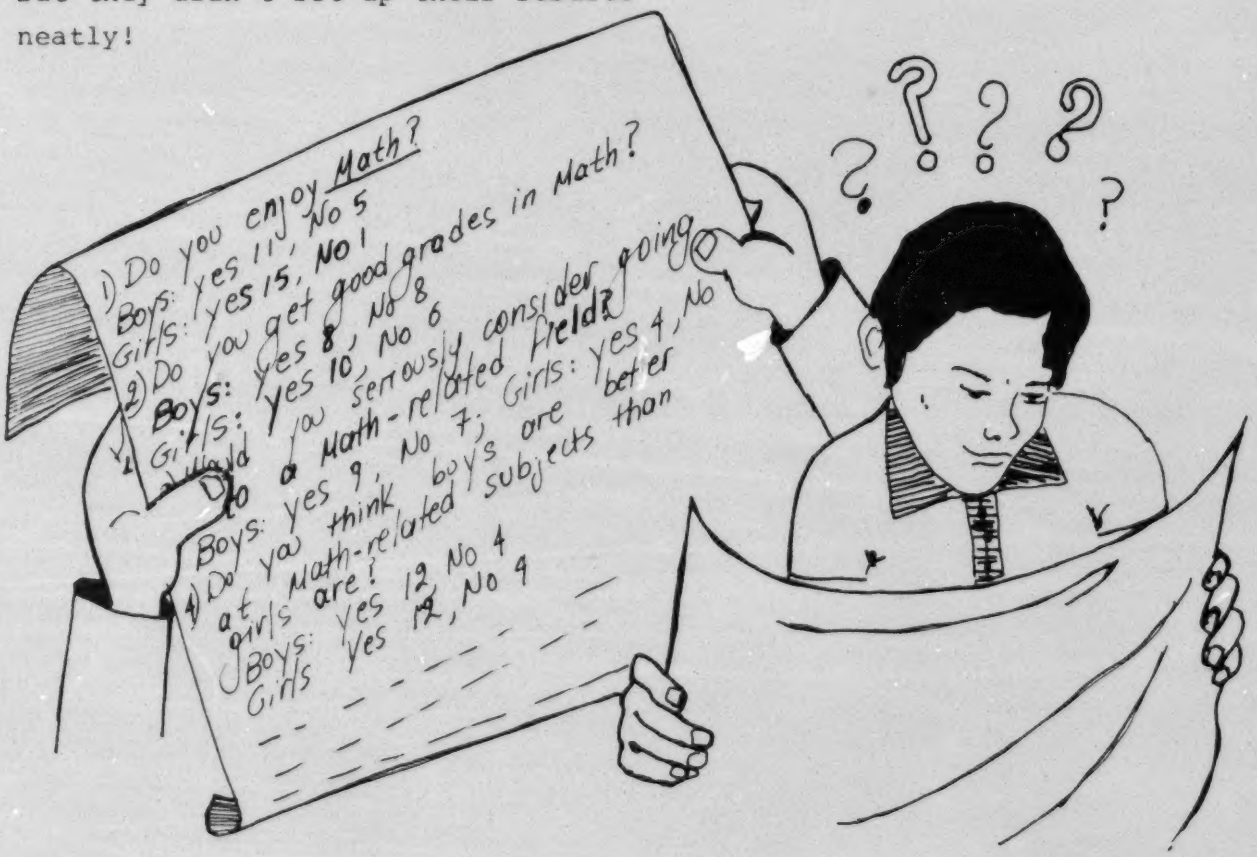
Collecting and Analyzing Data

Lesson 3: Frequency Tables

Activity A: What is a frequency table?

A sixth-grade math class at Martin Luther King, Jr. School completed an interview form about female and male attitudes toward math.

But they didn't set up their results neatly!


1) Do you enjoy Math?
Boys: Yes 11, No 5
Girls: Yes 15, No 1
2) Do you get good grades in Math?
Boys: Yes 8, No 8
Girls: Yes 10, No 6
Would you seriously consider going
Do a Math-related field?
Boys: Yes 9, No 7; Girls: Yes 4, No
4) Do ya think boys are better
at Math-related subjects than
girls are?
Boys: Yes 12, No 4
Girls Yes 12, No 4

Their teacher said, "Organizing data into a table helps!" So that's what they did. They made a frequency table to show their results. The table is shown below.

A frequency table tells how many times something occurs. For example, the frequency table below tells how many times boys and girls said yes when asked whether they liked math.

Interview Questions	Boys		Girls	
	Yes	No	Yes	No
1. Do you enjoy math?	11	5	15	1
2. Do you make good grades in math?	8	8	10	6
3. Would you seriously think about preparing for a career in math?	9	7	4	12
4. Do you think that boys are better at math than girls are?	12	4	12	4
5. Do you plan to take at least three math courses in high school?	13	3	10	6

As you can see, a frequency table helps to organize results. Use the frequency table to answer the following questions.

A-1 How many boys would consider going into a math-related career?

A-2 How many boys do not enjoy math? How many girls?

A-3 How many girls plan to take at least three math courses in high school?

A-4 According to this table, do more boys or more girls get good grades in math?

A-5 According to this table, would more boys or more girls prepare for a math-related career?

This frequency table shows the results of a test that had 10 questions:

Number Correct	Percent Score	Tally	Number of Students
10	100%	|||	3
9	____	𝍸 |	6
8	80%	𝍸 𝍸	10
7	70%	____	11
____	60%	𝍸 ||||	9

A-6 Complete the table by filling in the three blanks. (Use the rest of the data in the table to find your answers.)

A-7 How many students got 60% correct?

A-8 How many students got 7 correct?

A-9 What percent score is 8 correct?

A-10 How many students are there in the class?

A-11 How many students got 90% correct?

Activity B:
Thinking about time

Use the following information to complete a table like the one below. The information explains the time people working at home spend doing housework.

As you make your table, remember that people who work at home have a 7-day work week. People who work outside the home have a 5-day work week.

Food Preparation

Sunday:	3 hours
Monday:	2 hours
Tuesday:	3 hours
Wednesday:	2 hours
Thursday:	2 hours
Friday:	2 hours
Saturday:	4 hours

Family Care

Sunday:	3 hours
Monday:	2 hours
Tuesday:	4 hours
Wednesday:	4 hours
Thursday:	2 hours
Friday:	2 hours
Saturday:	3 hours

House Care

Sunday:	1 hour
Monday:	1 hour
Tuesday:	1 hour
Wednesday:	2 hours
Thursday:	2 hours
Friday:	1 hour
Saturday:	3 hours

Shopping and Running Errands

Sunday:	0 hours
Monday:	0 hours
Tuesday:	0 hours
Wednesday:	3 hours
Thursday:	1 hour
Friday:	0 hours
Saturday:	3 hours

Clothing Care

Sunday:	1 hour
Monday:	0 hours
Tuesday:	1 hour
Wednesday:	2 hours
Thursday:	1 hour
Friday:	2 hours
Saturday:	1 hour

Source. U.S. Department of Labor, Bureau of Labor Statistics, 1975.

Housework Time (in hours) for People Working at Home

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
Food Preparation								
House Care								
Family Care								
Shopping and Running Errands								
Clothing Care								
Total								

Adapted from *1975 Handbook on Women Workers*, U. S. Department of Labor, Women's Bureau, p. 173.

Activity C:
A working couple

Choose a partner for this activity.

Many studies show that women who work full-time still do most of the housework.

One family's times are recorded below. Make two frequency tables like the one shown in Activity B. Use the information below.

Frequency Table 1: Housework Time for the Working Woman		Frequency Table 2: Housework Time for the Working Man	
Food Preparation		**Food Preparation**	
Sunday:	2 hours	Sunday:	½ hour
Monday:	2 hours	Monday:	0 hours
Tuesday:	2 hours	Tuesday:	0 hours
Wednesday:	2 hours	Wednesday:	0 hours
Thursday:	2 hours	Thursday:	0 hours
Friday:	½ hour	Friday:	0 hours
Saturday:	2 hours	Saturday:	0 hours
House Care		**House Care**	
Sunday:	½ hour	Sunday:	0 hours
Monday:	1 hour	Monday:	½ hour
Tuesday:	1 hour	Tuesday:	½ hour
Wednesday:	2 hours	Wednesday:	0 hours
Thursday:	1 hour	Thursday:	0 hours
Friday:	1 hour	Friday:	0 hours
Saturday:	3 hours	Saturday:	1 hour
Family Care		**Family Care**	
Sunday:	1 hour	Sunday:	1 hour
Monday:	1 hour	Monday:	½ hour
Tuesday:	1 hour	Tuesday:	1 hour
Wednesday:	1 hour	Wednesday:	0 hours
Thursday:	1 hour	Thursday:	0 hours
Friday:	1 hour	Friday:	½ hour
Saturday:	1 hour	Saturday:	1 hour
Shopping and Running Errands		**Shopping and Running Errands**	
Sunday:	½ hour	Sunday:	½ hour
Monday:	½ hour	Monday:	0 hours
Tuesday:	2 hours	Tuesday:	2 hours
Wednesday:	0 hours	Wednesday:	0 hours
Thursday:	2 hours	Thursday:	1 hour
Friday:	1 hour	Friday:	0 hours
Saturday:	0 hours	Saturday:	2 hours
Clothing Care		**Clothing Care**	
Sunday:	0 hours	Sunday:	0 hours
Monday:	1 hour	Monday:	0 hours
Tuesday:	1 hour	Tuesday:	0 hours
Wednesday:	1 hour	Wednesday:	0 hours
Thursday:	1 hour	Thursday:	0 hours
Friday:	2 hours	Friday:	0 hours
Saturday:	1 hour	Saturday:	1 hour

Adapted from *1975 Handbook on Women Workers*, U. S. Department of Labor, Women's Bureau, p. 173.

Activity D:
Comparing work done by women and men

Now compare the three tables you completed in Activities B and C.

D-1 How much time do women who stay at home spend on housework each week?

D-2 How much time do working women spend on housework each week? How much time do working men spend on housework each week?

D-3 How many more hours do women at home spend doing housework than women at work?

D-4 How much time do working women have for themselves each week? That is, for how many hours can they do something besides working, doing housework, or sleeping? (Figure an average of 8 hours of sleep each night and 40 hours of work each week.)

D-5 How much time do working men have for themselves each week?

D-6 More women are working outside the home than ever before. In your opinion, why do women who work outside the home still do most of the housework?

D-7 What are some changes you would make so that housework could be shared?

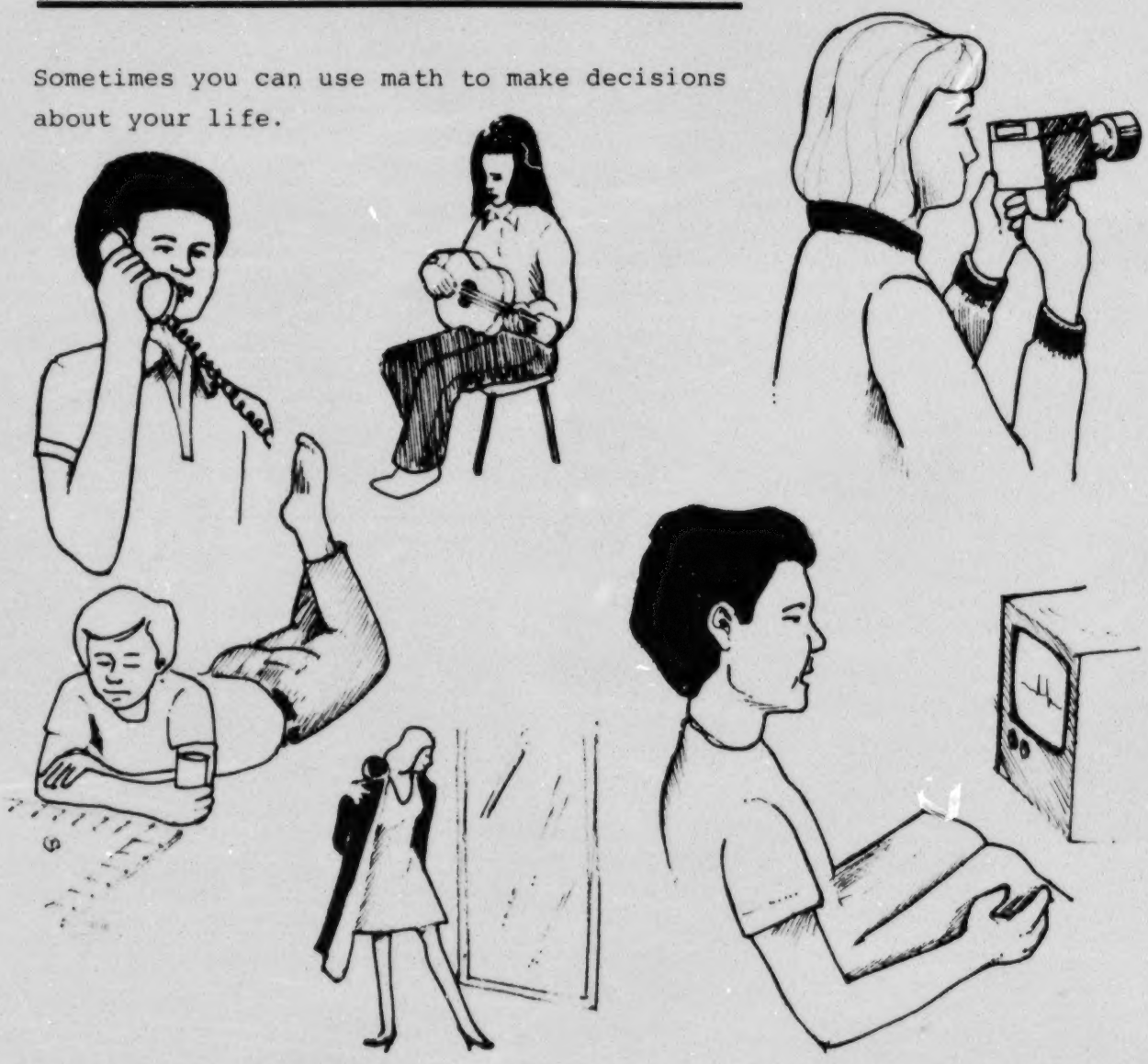
Activity E:
Class wrap-up

Discuss your answers for Activity D.

Lesson 4: More Practice with Frequency Tables

Activity A:
How do you spend your time?

Sometimes you can use math to make decisions about your life.



The frequency table below contains a list of activities. Make a table similar to this one. Record the amount of time you spend each day on each activity. Write in other activities you do and how much time you spend doing them.

Try to be as exact as possible about the amount of time you spend on each activity.

As you make your frequency table, remember that each day has a total of 24 hours. Be careful to add hours and minutes correctly.

Activity	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
Eating meals								
Being at school								
Watching television								
Sleeping								
Exercising (sports)								
Doing homework								
Other								
Other								
Total	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	168 hours

Activity B:
Are you satisfied with the way you spend your time?

Take another look at the totals on the frequency table you just made.

B-1 Are you satisfied with the time you spend on each activity? Why or why not?

B-2 What changes can you make to improve how much you get done and how well you do some activities? (You may need to spend more time on some activities to do them well.)

B-3 Make another frequency table. Think of a plan that will help you make better use of your time. Fill in your frequency table showing your new plan.

Activity C:
Class wrap-up

C-1 What changes did you decide to make in the way you spend your time?

C-2 Why did you decide to make these changes?

Lesson 5: The Mean, Mode, and Median

Activity A:
Finding the mean, mode, and median

How would you like to do some work in statistics? It's easier than you think.

Before you can work with statistics, you have to know the definition of some words:

The mean is one kind of average.

Example: Find the mean of these numbers:

6, 7, 9, 8, 5

Answer: 6+7+9+8+5 = 35
35 divided by 5 numbers = 7
The mean (or mean average) is 7.

The mode is the number that occurs most often.

Example: Find the mode of these numbers:

8, 9, 8, 7, 8, 9, 9, 7, 8, 7

Answer: Arrange the numbers (data) in a frequency table like the one below. In the data column, write each number. Each time the number appears, put a mark in the tally column. Then give the total marks for each number.

Data	Tally	Total
8	////	4
9	///	3
7	///	3

You can see that 8 appears more times on the list than the other numbers do. The mode is 8.

The median is the middle number when the numbers are arranged from highest to lowest or from lowest to highest.

Example:	Find the median of these numbers: 14, 14, 12, 11, 9, 8, 7
Answer:	Arrange the numbers in order from highest to lowest (14 to 7). You can see that the middle number is 11. There are three numbers on each side of 11. The median is 11.

Now use the information you just read to work the following problems.

A-1 Look at this set of data:

14	10	8	7	4
14	10	8	7	
12	9	8	6	

a. What is the mean?

b. What is the mode?

c. What is the median?

A-2 Look at this set of data:

13	7	6
13	7	6
12	7	4
8	6	2
7	6	1

a. What is the mean?

b. What is the mode? (A set of numbers may have more than one mode.)

c. What is the median?

A-3 Find the mean, mode, and median of these sets of data. When there are two middle numbers, the median will be the average of these two numbers. That is, it will be halfway between these two numbers.

a. 1, 1, 2, 2, 3, 3, 4, 5, 6

b. 16, 17, 18, 19, 20

c. 6, 6, 6, 6, 6, 6

d. 85, 87, 88, 89, 95, 96

Activity B: Using the mean, mode, and median to study real-life problems

Work the following problems.

B-1 Here is a list of incomes for women and men.

Men's Incomes	Women's Incomes
$ 6,500	$ 4,700
7,800	5,900
10,400	5,900
11,500	6,500
11,500	7,900
13,400	9,400
20,100	12,200

a. Find the mean, mode, and median of the list of men's incomes.

b. Find the mean, mode, and median of the list of women's incomes.

c. Was the median income higher for women or for men?

d. Do you think the median income in an occupation is usually higher for men or for women?

B-2 Look at the table below. These are actual statistics obtained from 1973 to 1977.

Median Income for Full-Time Workers				
Year	Women		Men	
	White	Minority	White	Minority
1977	$8,870	$7,945	$15,378	$10,768
1976	8,285	7,825	14,071	10,496
1975	7,514	6,834	12,884	9,561
1974	7,025	6,611	12,343	9,082
1973	6,544	5,772	11,633	8,363

Source: U.S. Department of Labor, Women's Bureau, and Bureau of Labor Statistics; *and* National Commission on Working Women, Center for Women and Work, Washington, D.C.

a. What is the median income for white men in 1975?

b. What is the median income for minority men in 1974?

c. What is the median income for white women in 1977?

d. What is the median income for minority women in 1976?

e. What group has the highest median income in all five years?

f. What group has the lowest median income in all five years?

g. Why do you think the incomes for all of the groups are higher in 1976 than in 1975?

h. Why might women's incomes be lower than men's? Give at least three possible reasons.

B-3 Look at the table below. These are actual statistics for 1975.

Median Incomes for Women and Men in 1975		
Occupation	Median Income	
	Women	Men
Professional	$10,524	$15,968
Managers	9,125	15,903
Operatives	6,241	10,953
Clerical Workers	7,562	12,136
Service Workers	5,414	9,491

Source: *U.S. Working Women: A Databook.* U.S. Department of Labor, Bureau of Labor Statistics, 1977, pp. 5 and 65.

a. What is the median income for women?

b. What is the median income for men?

Activity C: Class wrap-up

C-1 Discuss your answers for Activities A and B.

C-2 What are some of the reasons that minority groups make less money than whites? Which reasons are fair? Why? Which reasons are unfair? Why?

C-3 What are some of the reasons that women in general make less money than men? Which reasons are fair? Why? Which reasons are unfair? Why?

Activity D: Flight check

Did you understand this lesson? To find out, answer the following questions without looking back at the lesson. Then, your teacher will help you check your answers.

D-1 84, 86, 88, 88, 89, 90, 91

a. What is the mean?

b. What is the mode?

c. What is the median?

D-2 8, 7, 6, 7, 8

a. What is the mean?

b. What is the mode?

c. What is the median?

D-3 1978, 1978, 1978

a. What is the mean?

b. What is the mode?

c. What is the median?

D-4 8, 9, 9, 9, 9, 13, 17, 17, 17, 17, 18

a. What is the mean?

b. What is the mode?

c. What is the median?

D-5 Look at the table below.

Median Income for Full-Time Workers				
Year	Women		Men	
	White	Minority	White	Minority
1977	$8,870	$7,945	$15,378	$10,768
1976	8,285	7,825	14,071	10,496
1975	7,514	6,834	12,884	9,561

Source: U.S. Department of Labor, Women's Bureau, and Bureau of Labor Statistics; *and* National Commission on Working Women, Center for Women and Work, Washington, D.C.

a. What is the median income for white women in 1977?

b. What is the highest median income in all three years?

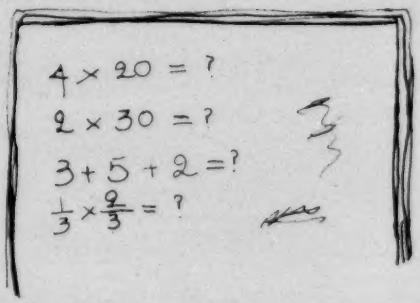
Lesson 6: More about the Mean

Activity A: Finding the mean

Do you know that the number of math courses you take in high school can be important later in your life?

People who take very few math courses often make less money than people who take several math courses. Also, they often have more trouble finding jobs.

What is the average number of boys and girls who take math courses in middle school, high school, and college? In this lesson, you will use math to find out some interesting information about this question.



To obtain this information, you must know how to find the mean average. To review, read the following problem:

Meghan had five test scores, as follows:

87, 89, 97, 100, 92

To figure the mean average of her test scores, she first added the scores:

$$\begin{array}{r} 87 \\ 89 \\ 97 \\ 100 \\ +\ 92 \\ \hline 465 \end{array}$$

Then she divided the sum by the number of scores:

$$5\overline{)465}\quad 93$$

Her average was 93. This is the mean average.

Now find the mean average of the problems below.

A-1 4 pounds, 62 pounds

A-2 7", 8", 12"

A-3 $10, $12, $17, $9

A-4 10 seconds, 12 seconds, 9 seconds, 13 seconds

A-5 70, 74, 66, 75, 62, 82, 96

A-6 7, 7, 7, 7

A-7 1979, 1979, 1979

A-8 1, 2, 3, 4, 5

A-9 33, 34, 35, 36, 37

A-10 9.4, 10.2, 11.3, 8.9, 7.5

Activity B:
Some word problems

Choose a partner and do this activity together.

Read the following problems and figure the mean averages. As you read, notice the differences in the boys' attitudes and the girls' attitudes.

B-1 Carol, Susan, Kate, and Jane are in middle school. They all enjoy math. Carol plans to take 2 math courses in high school, Susan plans to take 3, Jane plans to take 4, and Kate plans to take 3.

What is the average number of math courses they plan to take?

B-2 Now, look at the girls when they are about to graduate from high school:

Carol's parents encouraged her to take math. As a result, she took 2 math courses in high school.

Susan wanted to take several math courses. But her boyfriend told her that math was for boys. She took only one math course.

In tenth grade, Kate decided that she didn't need math, since she was planning to get married right after she graduated. Kate took only one math course in high school.

Jane liked people and wanted to be a manager. She found out how important math was in getting a management job. As a result, Jane took 4 math courses in high school.

What is the average number of courses the girls took?

B-3 Hal, Dennis, and Lloyd are trying to figure out how many math courses to take in high school. All three boys plan to take 4 courses each.

What is the average number of courses the boys plan to take?

B-4 Now, look at the boys when they are about to graduate from high school:

Hal didn't like math, but he knew it would help him get a better-paying job. He took 4 math courses.

Dennis had always liked math. He took 4 math courses.

Lloyd planned to go into business. As a result, he took 4 math courses.

What is the average number of math courses the boys took?

Now answer the following questions.

B-5 What were some differences in the attitudes of the boys and of the girls?

B-6 Which attitudes make sense to you? Why?

B-7 Which attitudes do you think the students might be sorry for later? Why?

B-8 Compare the boys' and girls' middle school plans with their high school actions.

a. Who followed through with their plans? Who didn't follow through?

b. Why do you think one group didn't follow through?

Activity C: Class wrap-up

Discuss your answers for Activities A and B.

Lesson 7: Rounding

Activity A: What is rounding?

"How much money do you have?" Leroy asked.
"About $2.00," Beth said.

Beth is using rounding—a way of estimating—to reply. Her answer, "About $2.00," is a rounded estimate of the exact amount of money. What is the exact amount of money Beth has? Look at the illustration.

Now look at the map of Florida. About how far is it from Tallahassee to Orlando?

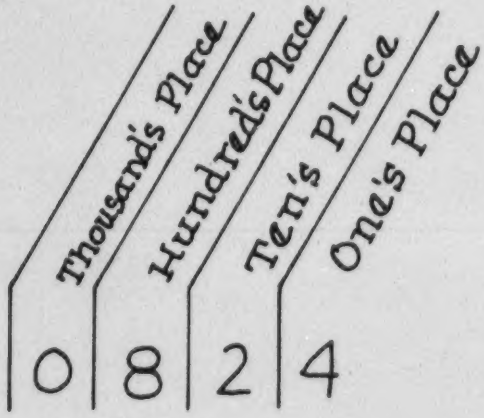
About how tall is Pedro?

In the illustration above, Alex has rounded the time to the nearest hour. What is the exact time?

You can see that rounding is something you do almost automatically.

Let's look at rounding more carefully. What happens when you round a number?

Do you remember the names of the places in our number system? Look at this example.



In order to understand rounding, you need to know the names of each number place.

Work these examples.

A-1 Which digit is in the ten's place of 5,867?

A-2 Which digit is in the thousand's place of 2,347?

A-3 Which digit is in the ten's place of 1,702?

A-4 Which digit is in the hundred's place of 7,824?

A-5 Which digit is in the thousand's place of 9,158?

A-6 Which digit is in the hundred's place of 2,345?

Now, how do you round 1,651 to the nearest hundred?

Step 1	Find the digit in the hundred's place.
Step 2	Find the digit to the right of it.
Step 3	a. If the digit to the right is 5 or more, add 1 to the hundred's place. Then put a 0 in each place after the hundred's place.
	b. If the digit to the right is less than 5, round it to 0. Then round each place after it to 0.
Answer:	In rounding 1,651 to the hundred's place, we use Step 3a. This is because the number to the right of the hundred's place is 5. The answer is 1,700.

When rounding, we try to make as little error as possible. In Step 3 in the previous example, we asked ourselves: "Is 1,651 closer to 1,600 or to 1,700?" It is closer to 1,700. Therefore, 1,700 is the correct answer.

A-7 Round 1,624 to the nearest hundred.

- 6 is in the hundred's place
- 2 is the digit to the right of it
- 2 is less than 5—round 2 to 0 and round each place after it to 0

What is your answer?

A-8 Round each of these numbers to the nearest hundred:

a. 4,563

b. 5,893

c. 1,228

d. 4,529

e. 3,689

f. 5,411

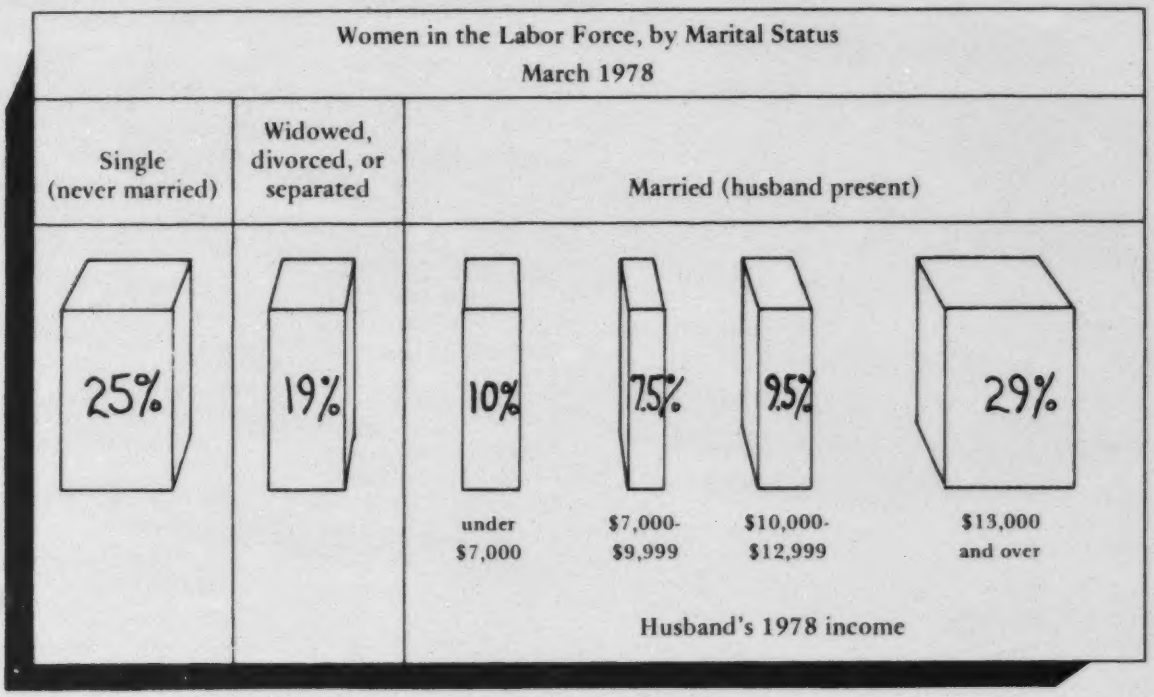
A-9 Using the same list of numbers (the original numbers in A-8), round each number to the nearest ten.

A-10 Using the same list of numbers (the original numbers in A-8), round each number to the nearest thousand.

Activity B:
Using rounding to think about information

Why do most women work—because they want to or because they have to?

Look at the chart below.



Source: U.S. Department of Labor, Women's Bureau.

Use the chart to answer the following questions. Round your answers to the nearest ten.

B-1 What percent of working women have no husband to support them or the family? (Hint: Percents can be added.)

B-2 What percent of married women in the labor force are working to supplement a husband's income of less than $7,000?

B-3 What percent of women in the labor force work to supplement a husband's income of $13,000 and over?

B-4 Using the chart, find what percent of women work because they have to. To do this, find the percent of women who have no husband to supplement their income. Then find the percent of women who are working to keep their family's income above poverty level ($7,000). Add these two figures together.

Now look at the following table.

Mean Average Income of Families, 1977	
Mean Average Income of All Families	$18,264
Type of Family	
Male head wage earner	19,686
Married, wife present	19,798
Wife a full-time worker	20,128
Wife not a full-time worker	14,984
Widowed, divorced, or separated	17,573
Female head wage earner	9,811

Source: *Statistical Abstract 1978.* U.S. Department of Commerce, Bureau of the Census, p. 459.

Use the table to answer the questions below. Round your answers to the nearest hundred.

B-5 a. What is the mean average income of families whose head wage earner is a male?

b. What is the mean average income of families whose head wage earner is a female?

B-6 a. What is the mean average income of families in which the wife is a full-time worker?

b. What is the mean average income of families in which the wife is <u>not</u> a full-time worker?

Activity C: Class wrap-up

C-1 Check your answers for Activities A and B.

C-2 What did you find out about why women work?

C-3 Why do you think the mean average income of families whose head wage earner is female is so much lower than that of families whose head wage earner is male?

Activity D: Flight check

Did you understand this lesson? To find out, answer the following questions without looking back at the lesson. Then, your teacher will help you check your answers.

D-1 Round the following numbers to the nearest hundred.

a. 378

b. 1,899

c. 38,098

d. 38,001

D-2 Round the following numbers to the nearest ten.

a. 999

b. 384

c. 34

d. 66

Lesson 8: Ratios and Percents

Activity A: What are ratios and percents?

A comparison of two sets of numbers is called a ratio. For example:

if A = { □ □ }

and B = { ▪ ▪ ▪ ▪ ▪ } ,

then the ratio of A to B is 2 to 5. (The ratio of B to A is 5 to 2.)

A ratio can be written in any of the following ways:

2 to 5 2/5 2:5

Usually ratios are reduced to the lowest possible numbers. For example, 4 to 10 can be reduced to 2/5 by dividing each part of the ratio by 2. Two is the lowest common denominator (or divisor) of this ratio, and the smallest whole number that can be divided into both parts.

Using a fraction—for example, 2/5—is the most common way to express a ratio.

A-1 How many parts are there in this set?

A-2 What fraction of the circle is shaded?

A-3 What fraction of the people in the circle are men? Women?

A-4 What is the ratio of women to men? Men to women?

A-5 Imagine that the circle represents people in the United States. If there were 100 people in the United States, how many of them would be women?

A-6 What are the ratios of these sets:

a. Set 1: ▲▲▲
Set 2: ▲▲▲▲▲▲

b. Set 1: O O O O
Set 2: O

c. Set 1: ■ ■
Set 2: ■ ■ ■ ■

Your answer to A-5 was a percent. Percent means per hundred, or by the hundred. The symbol for a percent is %.

A-7 How many people do you think the United States really has? In 1978, there were about 220,000,000 people in the United States. Assume that 50% of them were women. How many women were there?

NUMBER OF WOMEN = 50% x 220,000,000

= .50 x 220,000,000

= $\frac{50}{100}$ x 220,000,000

= $\frac{1}{2}$ x 220,000,000

A-8 Count the number of girls and the number of boys in your math class.

a. What is the ratio of boys to girls?

b. What is the ratio of girls to boys?

A-9 Change these ratios (fractions) to percents:

Example: 1/2 $2\overline{)1.00}$ $\begin{array}{r} .50 \\ -10 \\ \hline 0 \end{array}$ = 50%

a. 3/4

b. 1/3

c. 9/10

A-10 Change these percents to fractions:

Example: 70% = $\frac{70}{100}$ = 7/10

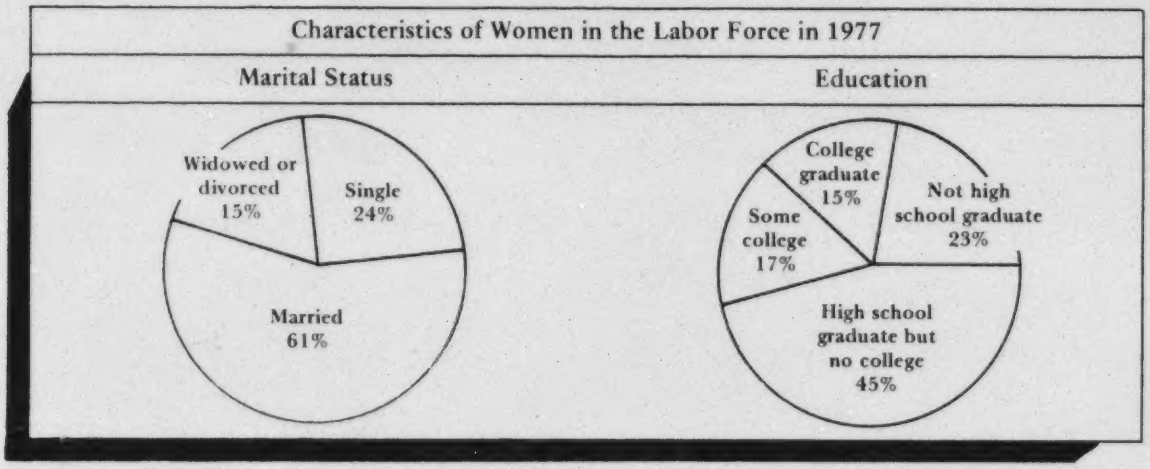
a. 40%

b. 33%

c. 25%

Activity B:
Using percents

Percents are often used in graphing data. For example, look at the circle graphs below.



Source: *Statistical Abstract 1978.* U.S. Department of Commerce, Bureau of the Census, pp. 400 and 404.

From these circle graphs, we can make the following statements:

- 61% of working women are married
- 15% of working women are college graduates
- 23% of working women did not graduate from high school
- 15% of working women are widowed, divorced, or separated

Use the circle graphs to answer these questions:

B-1 In 1977, what percent of working women were single?

B-2 What percent of working women had graduated from high school but not attended college?

B-3 What percent of working women had attended college, but not graduated?

B-4 What percent of working women were single, widowed, or divorced?

B-5 What fraction of working women were single?

B-6 What was the ratio of single women to women who were widowed or divorced?

B-7 Find these percents:

Example: 60% of 324 = $\begin{array}{r} 324 \\ \times .60 \\ \hline 194.40 \end{array}$

a. 80% of 30

b. 35% of 10

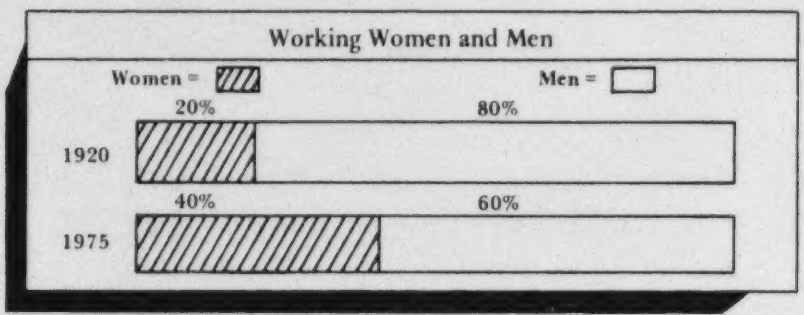
c. 92% of 60

d. 50% of 1,372

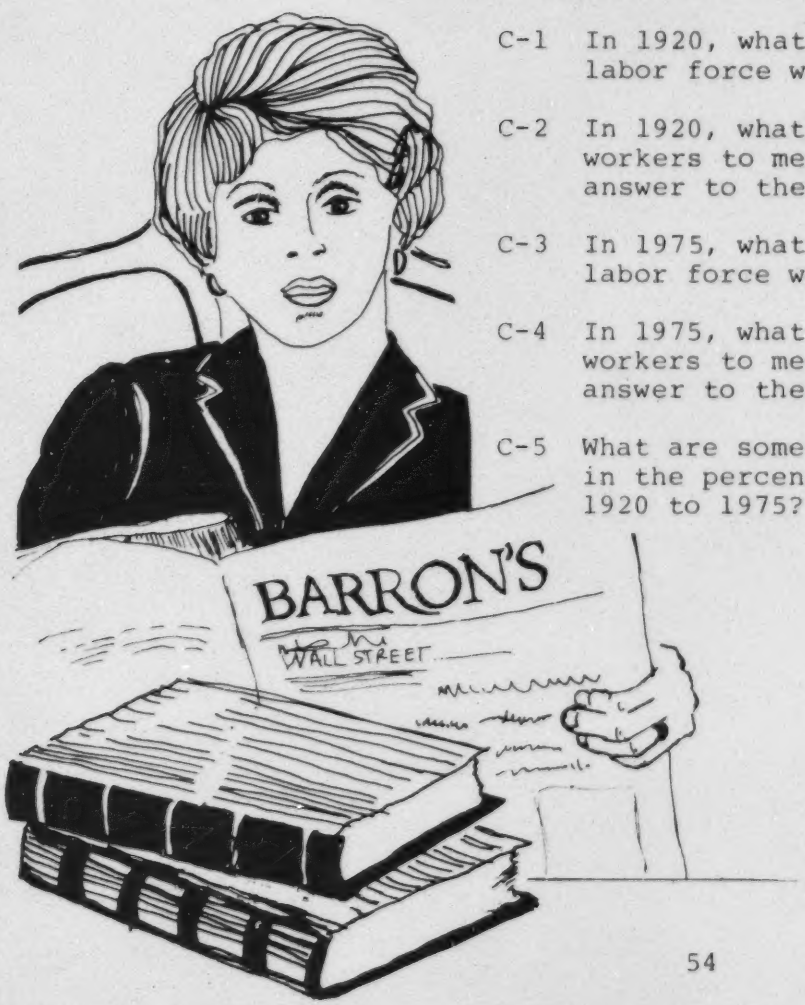
e. 25% of 16

Activity C:
Percent of women and men in the labor force

Look at the graph below and answer the questions that follow.



Source: *Women Workers Today.* U.S. Department of Labor, Women's Bureau, 1976.



C-1 In 1920, what percent of people in the labor force were women?

C-2 In 1920, what was the ratio of women workers to men workers? (Reduce your answer to the lowest common denominator.)

C-3 In 1975, what percent of people in the labor force were women?

C-4 In 1975, what was the ratio of women workers to men workers? (Reduce your answer to the lowest common denominator.)

C-5 What are some reasons for the increase in the percentage of women workers from 1920 to 1975?

Activity D: Class wrap-up

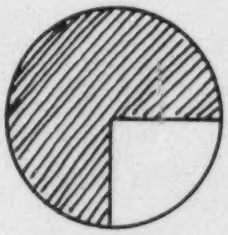
D-1 Check your answers for Activities A, B, and C.

D-2 As a class, compare the reasons you gave for C-5. Which reasons are probably the most important in explaining the increase in the percentage of women workers?

Activity E: Flight check

Did you understand this lesson? To find out, answer the following questions without looking back at the lesson. Then, your teacher will help you check your answers.

E-1 In this circle, what is the ratio of the shaded part to the unshaded part?



E-2 What are the ratios of these sets?

a. Set 1: ○○○○○
Set 2: ○ ○

b. Set 1: ◑
Set 2: ○○○○

E-3 Change these ratios to percents:

a. 1/2

b. 3/4

c. 7/8

E-4 Change these percents to fractions. Reduce them to the lowest common denominator.

a. 60%

b. 15%

c. 25%

53

Lesson 9: Pictographs

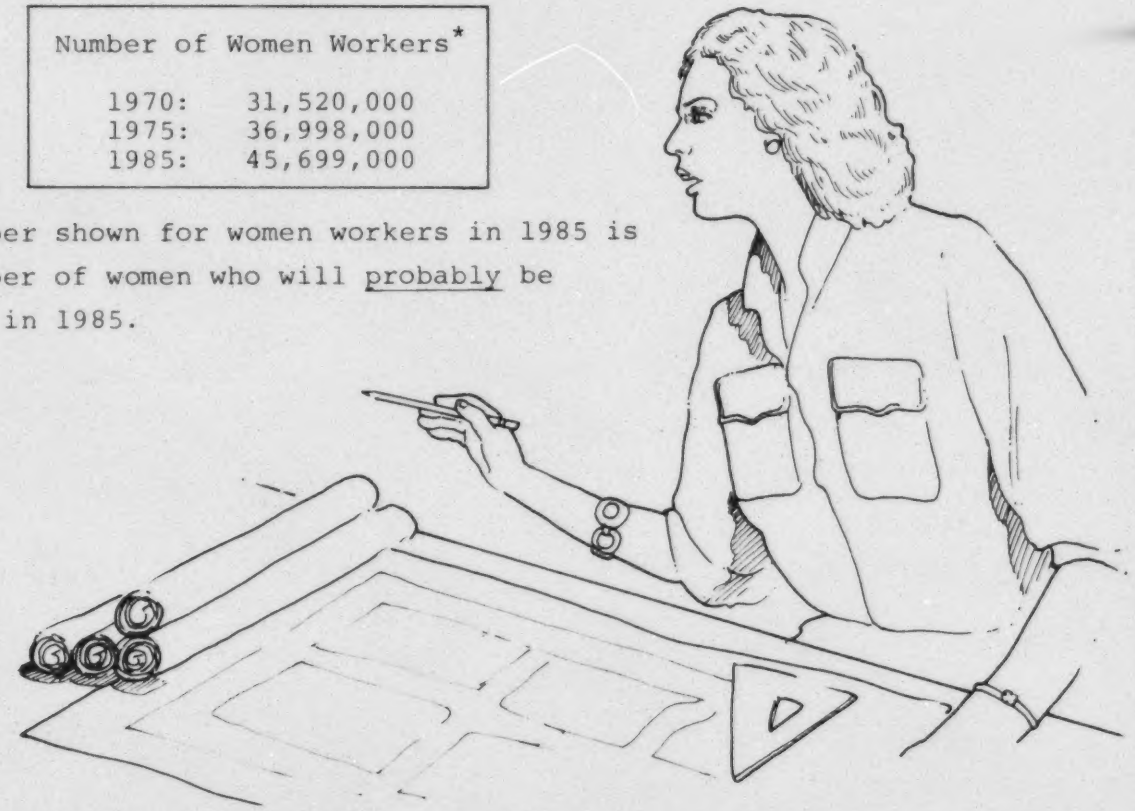
Activity A:
What are pictographs?

Often we use pictures to represent numbers. Graphs that present data in such a way are called pictographs.

Look at these data:

Number of Women Workers*	
1970:	31,520,000
1975:	36,998,000
1985:	45,699,000

The number shown for women workers in 1985 is the number of women who will probably be working in 1985.



*Source: *U.S. Working Women: A Databook.* U.S. Department of Labor, Bureau of Labor Statistics, 1977, p. 36.

In the pictograph below, these numbers are represented by pictures. As the key shows, each picture stands for five million women workers.

Number of Women Workers	
Key:	= 5,000,000 = 2,500,000
Year	Number of Women Workers
1970	
1975	
1985	

(Pictographs are drawn to the nearest 2½ million of data.)

A-1 Did the number of women workers from 1970 to 1975 increase or decrease?

A-2 Here are some more data. Use the data to complete a pictograph like the one below.

Median Income for Men in 1975*

Managers:	$16,000
Clerical Workers:	12,000
Service Workers:	9,000
Professionals:	16,000

Median Incomes for Men in 1975		
Key:	= $2,000	= $1,000
Job		Amount of Money

*Source: U.S. *Working Women: A Databook.* U.S. Department of Labor, Bureau of Labor Statistics, 1977 p. 36.

A-3 Make a pictograph showing the median income of women for the same jobs. Use the data given below. Be sure to title your pictograph and show the key.

Median Income for Women in 1975*

Managers:	$ 9,000
Clerical Workers:	8,000
Service Workers:	5,000
Professionals:	10,000

Activity B: Average number of children per family

Form a group with four or five other students and do this activity together. Everyone in the group should do each problem.

As you can see from the first pictograph, more and more women are working. Today, more than half of all women between the ages of 18 and 64 are working.

There are many reasons for the fact that more women are working. For one thing, it is easier for women to work if they have fewer children. Look at the pictograph on the next page.

*Bureau of the Census, *Statistical Abstracts of the U.S.*, 1976
U.S. Department of Commerce

Average Number of Children per Family		
Key:	= 1 child	= ½ child
1900		
1975		

Source: U.S. Department of Commerce, Bureau of the Census.

B-1 What general statement can you make from this pictograph?

B-2 In your group, find the average number of children in each person's family. To do this, each member of the group should answer the following questions.

a. How many brothers and sisters does your mother have?

b. How many brothers and sisters does your father have?

c. How many brothers and sisters do you have?

B-3 Now combine the responses of your group members. To do this, fill in a form like the one below. Make sure to include yourself and each group member as you fill in the number of children in each student's family.

Number of Children			
	Mother's family	Father's family	Student's family
Student 1	_____	_____	_____
Student 2	_____	_____	_____
Student 3	_____	_____	_____
Student 4	_____	_____	_____
Student 5	_____	_____	_____
Total:	_____	_____	_____
Average:	_____	_____	_____

a. What is the average number of children in the families of the mothers in your group?

b. What is the average number of children in the families of the fathers in your group?

c. What is the average number of children in the families of the students in your group?

B-4 In general, are the families of your mothers and fathers larger or smaller than your own families?

B-5 Make a pictograph showing the results of your group's averages. Use the graph below to guide you.

Average Number of Children in Our Families	
Key:	☺ = ONE CHILD
Mother's family Father's family Student's family	

B-6 Look at the pictograph on page 60.

a. Is the average family size in your group larger or smaller than the average family size in 1900?

b. Is the average family size in your group larger or smaller than the average family size in 1975?

Activity C: Class wrap-up

C-1 Check your answers for Activities A and B.

C-2 Are families larger or smaller today than they were in 1900? Why?

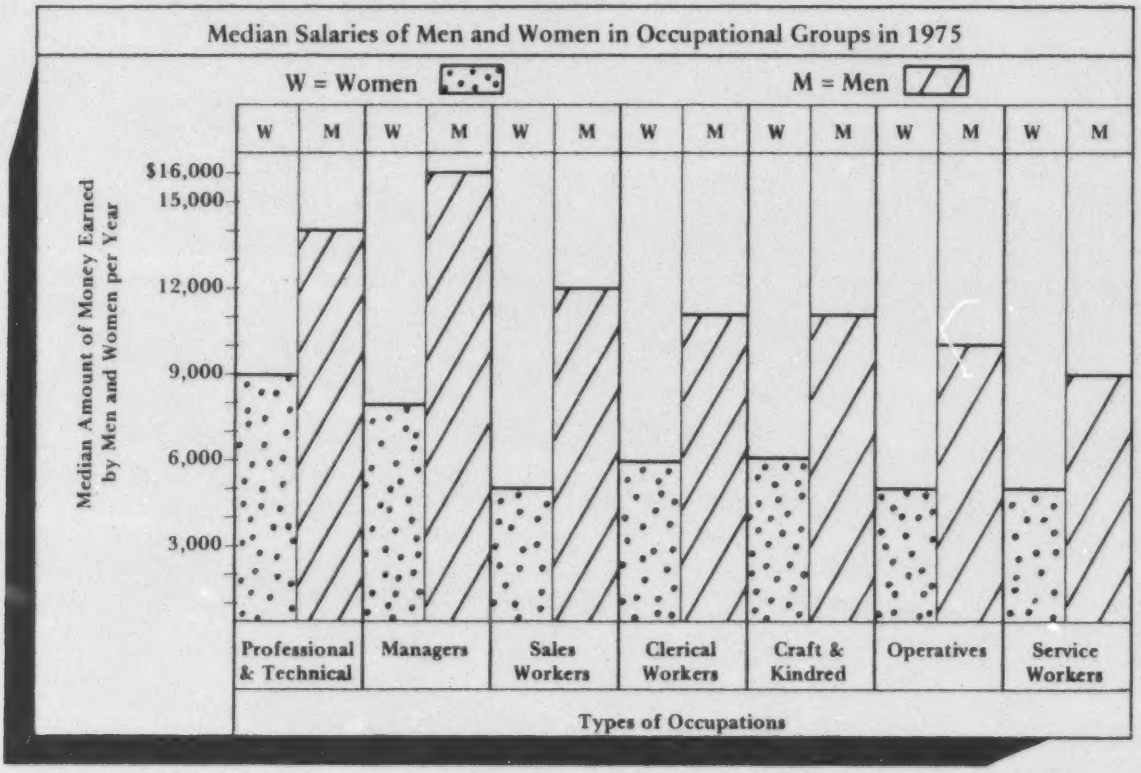
C-3 Does the decrease in family size affect the number of women who work? Explain your answer.

Lesson 10: Histograms

Activity A: What is a histogram?

You may do this activity by yourself or with your class.

The graph below is called a histogram. A histogram is a kind of bar graph. It is easy to understand data on a histogram. This histogram shows the median salary for men and women in certain occupations.



Source: *The Earnings Gap between Women & Men.* U.S. Department of Labor, Women's Bureau, 1976.

Use the histogram to find the answers to the following questions.

A-1 How much money do women sales workers earn?

Step 1 Find the column for sales workers on the bottom of the graph.

Step 2 Find the part of the column that pertains to women sales workers.

Step 3 Move to the top of the column. Then move across to the left at the top of the shaded part of the column.

A-2 In which occupational group do men earn a median salary of $10,000?

Step 1 Find the line indicating $10,000 on the side of the graph.

Step 2 Move across the graph until you find a column corresponding to $10,000.

Step 3 Move down the column to see what job group it represents.

A-3 In which occupational group do women earn a median salary of $8,000?

A-4 In which occupational group do men earn a median salary of $12,000?

A-5 What is the median salary of women professional and technical workers?

A-6 What is the difference in the median salaries of men and women sales workers?

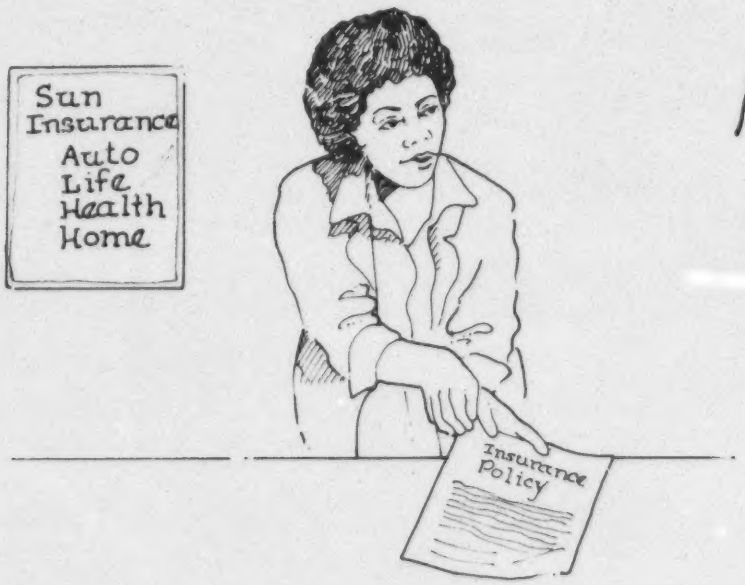
A-7 The median salary of male managers is how much higher than the median salary of female managers?

The seven occupational groups in this histogram include many different kinds of jobs. Here are some examples of jobs in each group.

- Professional and technical workers: Examples are school teachers, university professors, doctors, nurses, lawyers, laboratory technicians, accountants, engineers, computer programmers

- Managers and administrators: Examples are bank officers, store managers, school principals, university presidents, people in charge of government offices

- Sales workers: Examples are sales clerks in stores, real estate agents, insurance agents



- Clerical workers: Examples are secretaries, postal clerks, bookkeepers, cashiers, bank tellers

- Craft and kindred workers: Examples are automobile mechanics, electricians, carpenters, bakers, plumbers

- Operatives: Examples are machine welders, seamstresses, gas station attendants, bus drivers

- Service workers: Examples are cleaners, cooks, waiters and waitresses, nursing aides, hairdressers

Activity B:
Comparing female and male workers

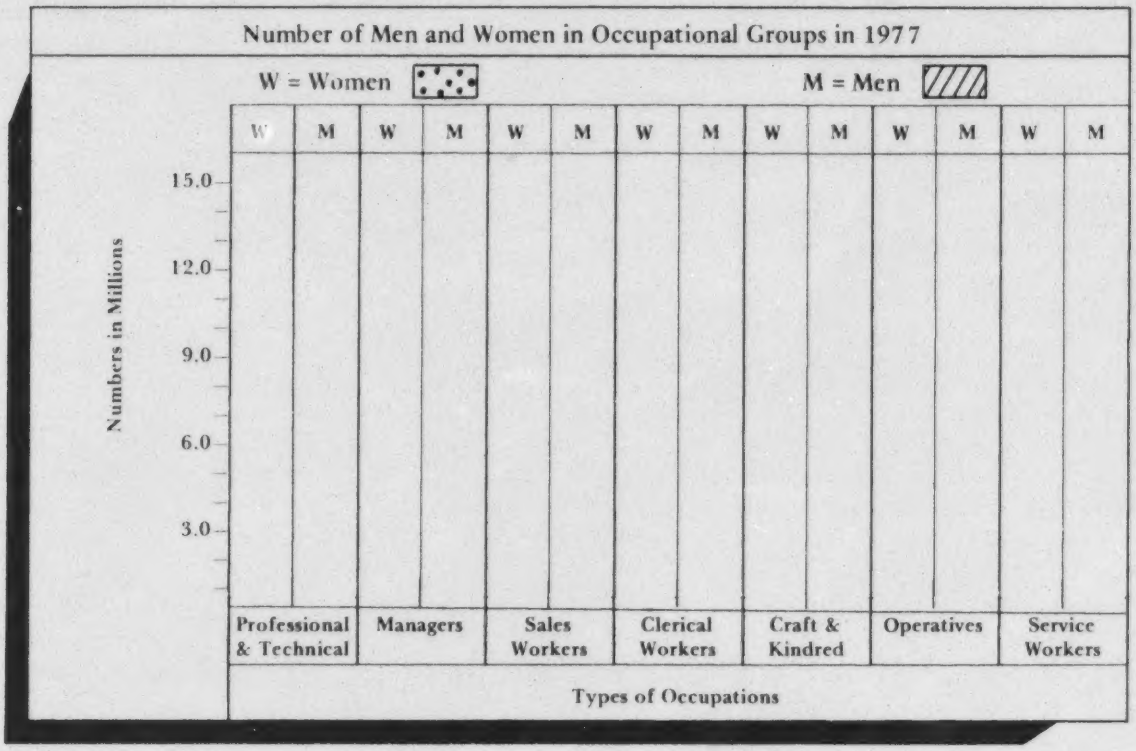
B-1 Look at the following frequency table.

Number of Men and Women in Occupational Groups in 1977		
Occupation	Women	Men
Clerical Workers	12,700,000	3,400,000
Service Workers	7,700,000	4,700,000
Professional and Technical	5,800,000	7,800,000
Operatives	4,200,000	6,300,000
Sales Workers	2,500,000	3,300,000
Managers	2,200,000	7,500,000
Craft and Kindred	600,000	11,300,000

Source: *Statistical Abstract 1978.* U.S. Department of Commerce, Bureau of the Census, p. 418.

Note: Numbers are rounded to the nearest hundred thousand.

Use the information on the frequency table to fill in a histogram like the one below.



B-2 Which occupations have more women than men?

B-3 Do you think the occupations that have more women than men are high-paying or low-paying, compared with the other occupations? (Hint: Look at the first histogram again.) Why?

Activity C: Class wrap-up

C-1 Check your answers for Activities A and B.

C-2 Discuss your answers to B-3.

C-3 Why are more and more women moving out of traditionally female careers and into traditionally male careers?

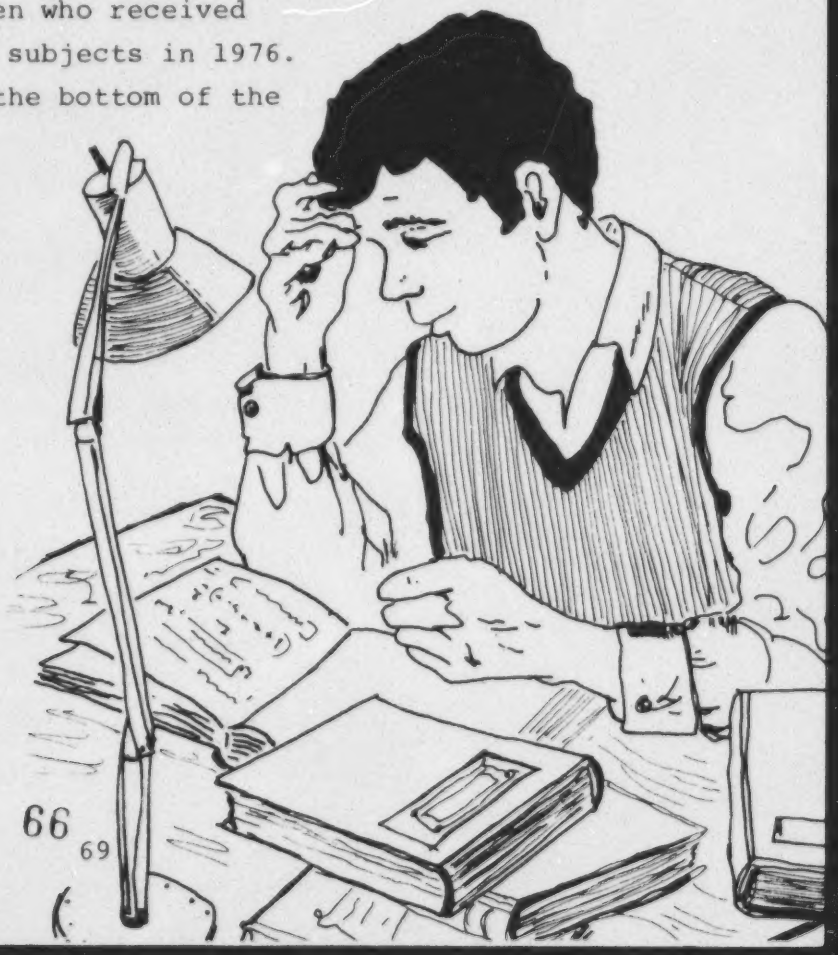
C-4 If you were ready to go to college, what career would you prepare for? Why?

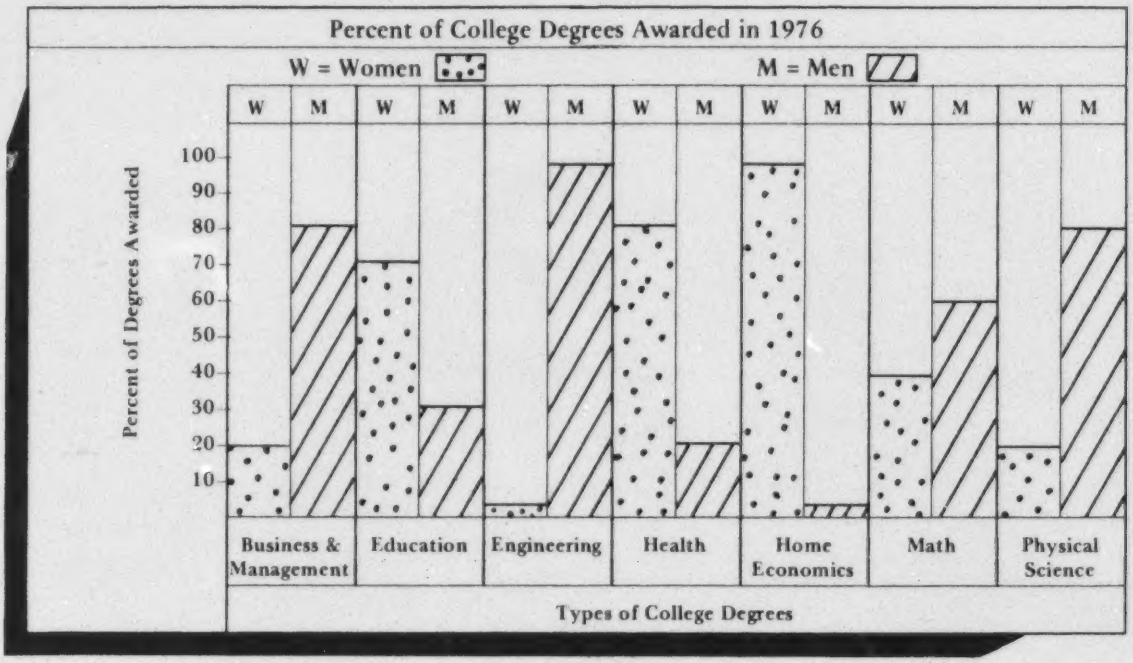
Lesson 11: More Practice with Histograms

Activity A: College courses

In the last lesson, you saw that some jobs are held by more men than women. Other jobs are held by more women than men.

The courses people take in college help determine what jobs they will have after graduation. The following histogram shows the percent of women and men who received college degrees in certain subjects in 1976. The subjects are shown at the bottom of the histogram.





Source: Brown, George H. *Bachelor's Degree Awards to Women.* U.S. Department of Health, Education, and Welfare, Education Division, pp. 8-9.

Use the histogram to answer the following questions.

A-1 What percent of degrees in business and management were awarded to women?

A-2 What percent of degrees in mathematics were awarded to men?

A-3 What percent of degrees in education were awarded to women?

A-4 In which subject(s) is the difference between the percent of women and men the greatest?

A-5 a. Which subject has the highest percentage of women?

b. Why do you think there are so many more women than men in that subject?

A-6 a. Which subject has the highest percentage of men?

b. Why do you think there are so many more men than women in that subject?

A-7 Which subjects do you think lead to better-paying jobs than others?

Activity B (discussion): Comparing females and males in college courses

Discuss your answers for Activity A.

Activity C: Comparing female and male college enrollments

C-1 Make a histogram based on the information in the frequency table below.

(Hint: Round the numbers to the nearest hundred thousand for scale. For example, 5,369,000 would be rounded to 5,400,000 on the histogram.)

College Enrollment of Women and Men from 1970 to 1977

Year	Women	Men
1977	4,848,000	5,369,000
1976	4,654,000	5,296,000
1975	4,355,000	5,342,000
1974	3,901,000	4,926,000
1973	3,502,000	4,677,000
1972	3,460,000	4 853,000
1971	3,236,000	4,850,000
1970	3,013,000	4,401,000

Source: *Statistical Abstract 1978.* U.S. Department of Commerce, Bureau of the Census, p. 160.

C-2 What are some of the reasons for the fact that women are often paid less than men? Think of information from this lesson and from the previous lesson on histograms.

Activity D:
A panel discussion

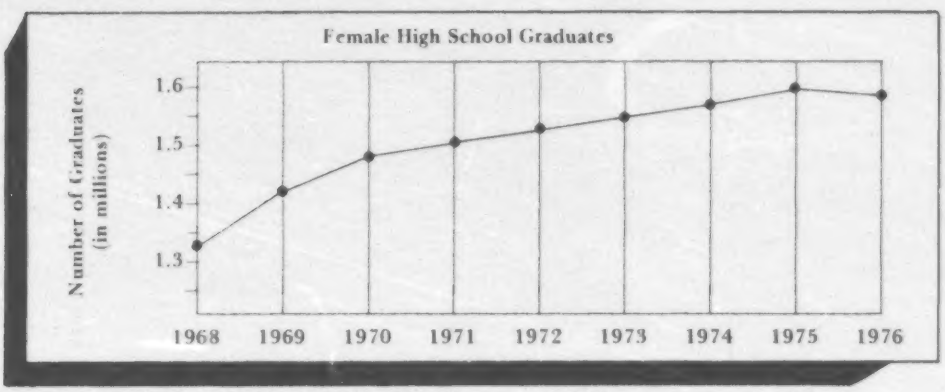
Your teacher will ask four or five volunteers to form a panel to discuss C-2 and possible solutions to the problem. Both females and males will be on the panel.

The panel discussion will include time for questions from other members of the class.

Lesson 12: Line Graphs

Activity A: What is a line graph?

Line graphs are often used to show how facts change as time passes. Study the following line graph.



Source: *Statistical Abstract 1978.* U.S. Department of Commerce, Bureau of the Census, p. 159.

On the graph, the number of women is given in millions. That is, 1.6 means 1,600,000. A point halfway between 1.5 and 1.6 means 1,550,000.

Use the graph to answer these questions.

A-1 What was the increase in female high school graduates from 1974 to 1975?

A-2 In which year was the increase the greatest?

A-3 In which year was there a decrease?

Here are some data on the number of male high school graduates.

Year	Number of Men
1968	1,340,000
1969	1,400,000
1970	1,400,000
1971	1,450,000
1972	1,500,000
1973	1,500,000
1974	1,500,000
1975	1,550,000
1976	1,600,000

Source: *Statistical Abstract 1978.* U.S. Department of Commerce, Bureau of the Census, p. 159.

A-4 Make a line graph similar to the one you just studied. Use the title "Male High School Graduates" for your line graph. Use the information above to complete your line graph, following these steps:

Step 1 Look at each part of the data—for example, 1968, 1,340,000.

Step 2 Find 1968 at the bottom of your graph.

Step 3 Find 1,340,000 on the left side of your graph.

Step 4 Put a dot at the point where 1968 and 1,340,000 meet.

Step 5 Repeat this process for all the data.

Step 6 Use lines to connect the dots.

A-5 What was the increase in male graduates from 1970 to 1971?

A-6 In which year was the increase in male graduates the greatest?

A-7 In which year was there a decrease in male graduates?

Activity B:
Comparing college enrollments

Sometimes we put two sets of data on one line graph. This helps us to compare the data.

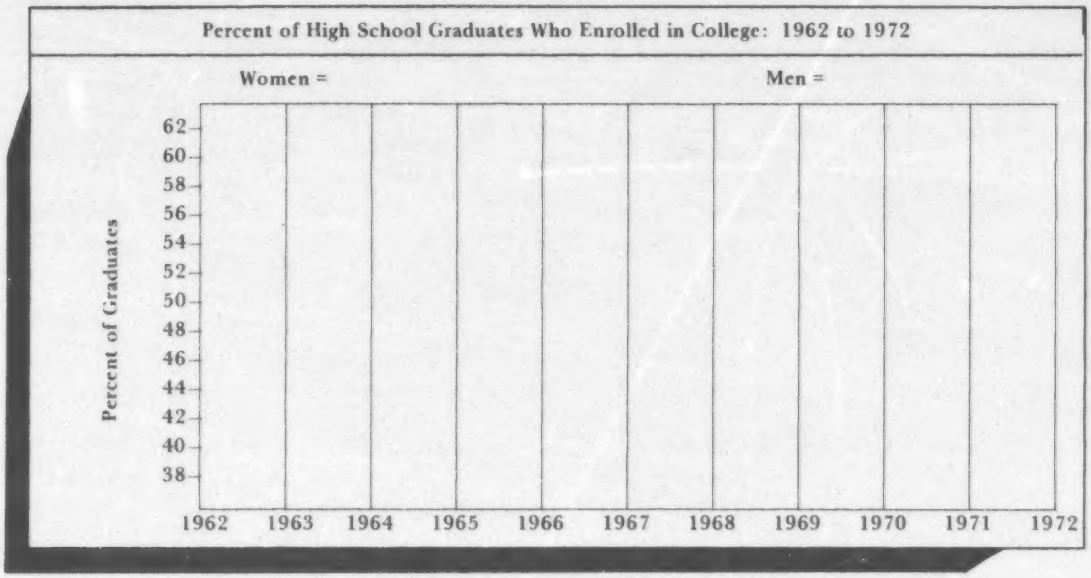
Here are some data on the percent of high school graduates who went directly to college.

Year of Graduation	Percent of Women	Percent of Men
1962	43	55
1963	39	52
1964	41	57
1965	45	57
1966	43	59
1967	47	58
1968	49	63
1969	47	60
1970	49	55
1971	50	58
1972	46	53

Source: *1975 Handbook on Women Workers.* U.S. Department of Labor, Women's Bureau, pp. 198, 199.

The percentages are for female and male high school graduates attending college. For example, find the number 43 under the column for percent of women. This means that 43 percent of all female high school graduates in 1962 went to college that year.

B-1 Use the preceding data to make a line graph like the one below. You will have two sets of lines: one for the data about women and one for the data about men. Draw a dotted line for women and a solid line for men.



B-2 Did a higher percent of female or male high school graduates attend college?

B-3 During which years was there the most difference between the percent of men and women attending college? The least difference?

B-4 During which year was the percent of females attending college higher than the percent of males?

B-5 What are some other conclusions (general statements) you can make from this graph?

Activity C: Class wrap-up

Discuss your answers for Activities A and B.

Lesson 13: Circle Graphs

Activity A:
What is a circle graph?

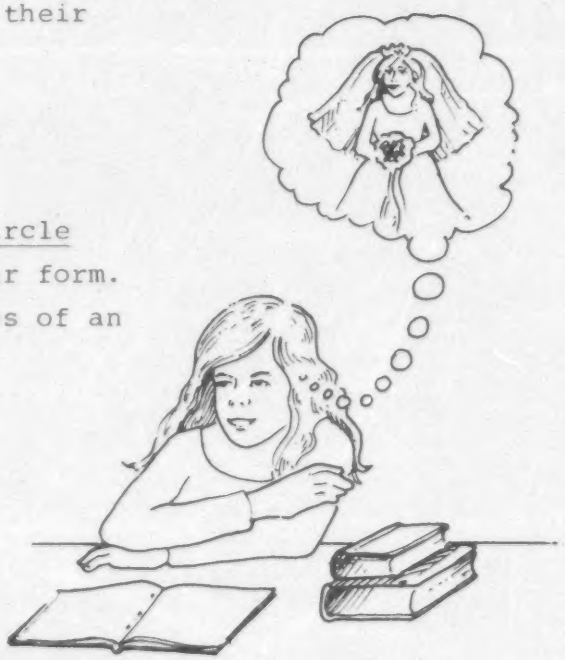
Some students plan their future carefully. Others have no idea what their career will be.

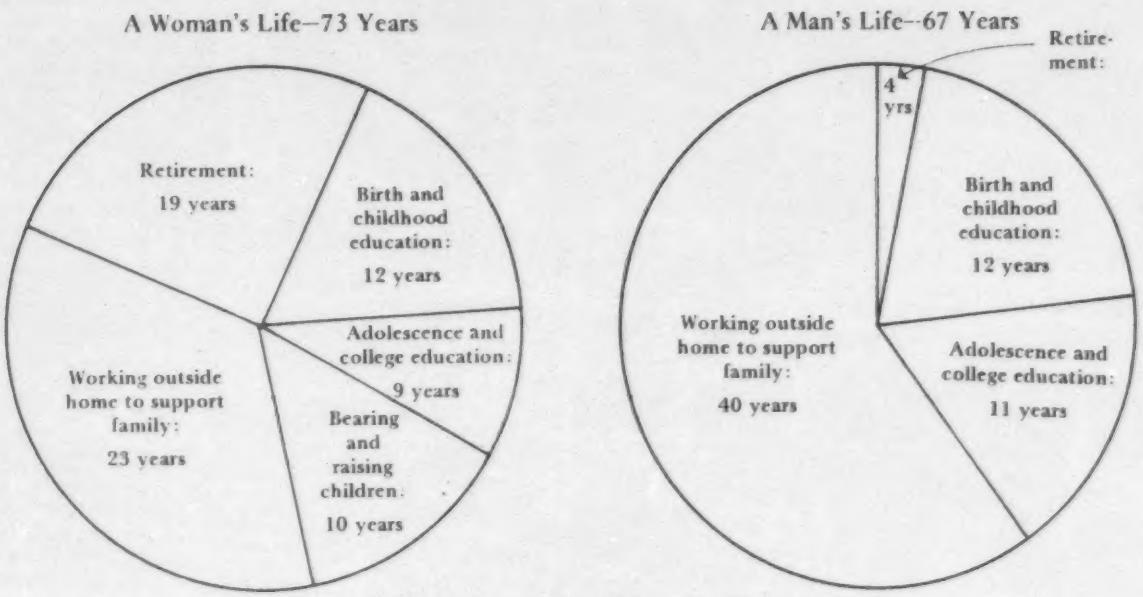
Girls often plan to get married after high school. They may plan to be supported by their husbands for the rest of their lives.

Boys often plan to work in a career. They plan to marry a woman who will raise their children.

But what really happens?

To find out, look at the following circle graphs, which present data in circular form. These graphs help us compare the lives of an average American woman and man.





Source: U.S. Department of Labor, Bureau of Labor Statistics.

Many women are spending fewer years working inside the home and a greater number of years working outside the home. A study shows that in 1977, 47 percent of all women aged 16 years or older were working.*

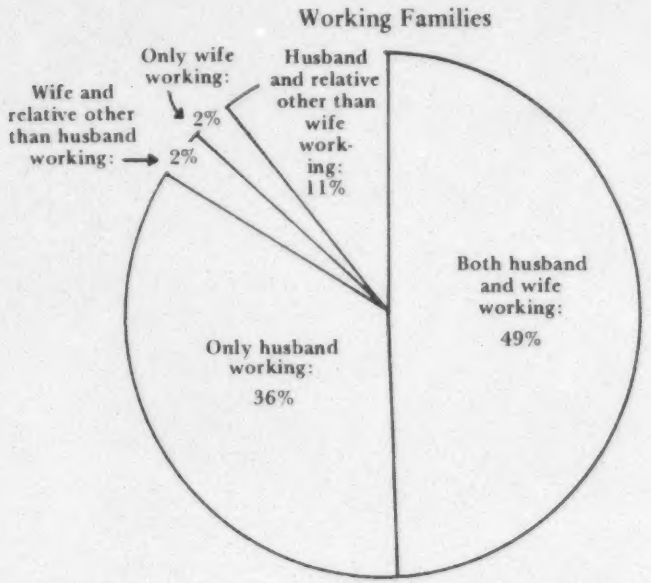
Of these working women:

- 24% were single
- 15% were widowed, divorced, or separated
- 61% were married

A-1 Make a circle graph to show these statistics on working women. Make sure to title your graph and label its parts.

*Source: *Statistical Abstract 1978*. U.S. Department of Commerce, Bureau of the Census, p. 404.

In 1972, a survey showed that in most families the husband is not the only one who works outside the home. Study the circle graph below and use it to answer the questions that follow.



Source: *1975 Handbook on Women Workers.* U.S. Department of Labor, Women's Bureau, p. 139.

A-2 In what percent of the husband-wife families do both the husband and the wife work?

A-3 In what percent of the husband-wife families does the husband not work?

A-4 In what percent of the husband-wife families does only the husband work?

Activity B: Class wrap-up

B-1 Check your answers for Activity A.

B-2 Give at least two reasons for each of the following facts:

a. More women are working today than ever before.

b. Forty-two percent of working women are single or are the head of a household.

c. Thirty-four percent of families with females as the head of the household have incomes below the poverty level.

d. Women receive the largest percent of public aid and welfare payments.

Activity C: Flight check

Did you understand this lesson? To find out, answer the following question without looking back at the lesson. Then, your teacher will help you check your answers.

Assume that you are going to live 100 years. Make a circle graph that shows how you plan to spend your time.

Lesson 14: Thinking about Your Education

Activity A: What next?

After you graduate from high school, how many more years of schooling do you want to get? Include junior college, vocational-technical school, college, university, or other types of schooling.

A-1 Your teacher will ask everyone in your class the above question. As each person answers, record the answers on a frequency table. To make the table:

Step 1 Decide on the range of years (top and bottom points).

Step 2 Decide on the intervals (how much between each point).

Step 3 Construct the frequency table.

After 15 people have answered, your table might look like this:

Plans for Education after High School				
Years of Education after High School	Tallies		Frequency	
	Girls	Boys	Girls	Boys
8				
7		/		1
6				
5				
4	~~𝍸~~	///	5	3
3				
2	/	//	1	2
1				
0	//	/	2	1

In the tallies column, note how every fifth tally mark crosses the other four marks. This makes it easy to find the totals.

After you complete your frequency table, answer the following questions.

A-2 What is the mean average number of years of education after high school that the girls in your class want to have?

A-3 What is the mean average number of years of education after high school that the boys in your class want to have?

A-4 What is the mean average number of years for the entire class?

A-5 Construct a histogram of the data you collected.

A-6 Construct a line graph of the data you collected.

A-7 What is the median number of years of education after high school for the girls? For the boys? For the class?

A-8 What is the mode of the number of years of education after high school for the girls? For the boys? For the class?

Lesson 15: What's Your Line?

Activity A:
It's your first job!

You have just been hired at your first job. You will be given a card that lists information about your job. Form groups with others who have your job type. Some groups will be larger than others.

Group A: Clerical workers

Group B: Professional and technical workers

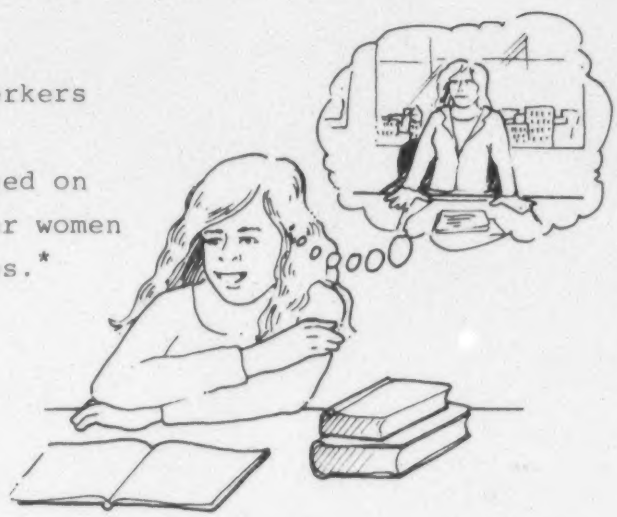
Group C: Managers

Group D: Service workers

Group E: Sales workers

Group F: Craft and kindred workers

The information on your card is based on actual jobs and average salaries for women and men workers in the United States.*



*The information on the job cards is adapted from the *Occupational Outlook Handbook 82-83* and *Occupational Earnings of Men and Women*, April 1982, published by the U.S. Department of Labor.

In your group, discuss the following questions. Choose a group recorder to write the group's answers.

A-1 a. How many people are in your job type?

b. How many men are in your job type?

c. How many women are in your job type?

A-2 If you do not have the same number of women as men, why do you think this happened?

A-3 Do you think there should be about the same number of men as women in your job type? Why or why not?

A-4 Do you think men and women can do all the jobs in your group equally well? Why or why not?

A-5 Who gets higher salaries in your job type: men or women?

A-6 a. In your group, are there two people who have similar jobs, job descriptions and requirements, but have different salaries?

b. Who has the higher salary: the man or the woman?

c. Do you think this is fair? Why or why not?

A-7 How many jobs in your group require some math or math-related courses (such as accounting and finance)?

Activity B (discussion): Comparing females and males in jobs

B-1 Discuss your answers for Activity A.

B-2 In the clerical workers' group, the administrative assistant (man) and secretary (woman) have similar job descriptions but have different salaries. What is the difference in their salaries?

B-3 In the professional and technical workers' group, the man chemist and woman chemist have the same job title, description, and requirements. But one of them gets a higher salary. What is the difference in their salaries?

B-4 In the managers' group, the man and woman sales managers of retail stores have the same job title, description, and requirements. What is the difference in their salaries?

B-5 In the sales workers' group, the man and woman retail sales workers have the same job title, description, and requirements. What is the difference in their salaries?

B-6 Some job groups have more men than women working in them. For example, traditionally female jobs include teaching, nursing, and secretarial work. Traditionally male jobs include most other types of work.

If your group had more women than men, write the salaries of your group on one side of the chalkboard.

If your group had more men than women, write the salaries of your group on the other side of the chalkboard.

a. Which job groups get better salaries: the ones with more men or more women?

b. Why do you think they get different salaries?

Activity C:
What jobs interest you?

C-1 Did you like the job you got on your card? Why or why not?

C-2 If you did not like the job on your card:

a. What kind of job would you like? (It can be any job, not only the ones on the cards.)

b. Find out the job requirements for the kind of job you want and list them.

c. How can you prepare for this job?

You might change your mind later about the job you want—many people do. It's good to watch for other jobs you might like.

Activity D:
Making changes

What changes would you like to see take place in the jobs and salaries held by men and women? What can you do to help change things? What can others do?

In the past few years, some women have begun to get jobs that used to be held mainly by men. Some men have begun to get jobs that used to be held mainly by women. Also, men and women in the same jobs are beginning to receive similar salaries. It is possible to change things!

Form a group with three or four other students. Choose a group recorder to write your group's answers to D-1 and D-2.

D-1 Make a chart listing the changes you would like to see in jobs and salaries for women and men.

D-2 For each change, discuss ways you and others can help make those changes.

D-3 Present your plan for change to the class.

Man

Job Type:
Professional and Technical

Job:
Chemist

Description:
Do basic research in chemistry

Requirements:
College degree in chemistry

Salary:
$25,584

Woman

Job Type:
Professional and Technical

Job:
Elementary school teacher

Description:
Teach elementary school children basic math, language, science, and social studies

Requirements:
College degree in education; teacher certification

Salary:
$16,172

Man

Job Type:
Sales Manager

Job:
Manager, retail store

Description:
Supervise other workers, advertising, buying and selling, customer relations

Requirements:
Four years college helpful but not necessary

Salary:
$15,760

Woman

Job Type:
Professional and Technical

Job:
Chemist

Description:
Do basic research in chemistry

Requirements:
College degree in chemistry

Salary:
$19,454

Man

Job Type:
Manager

Job:
City manager

Description:
Manage daily activities of a city, such as garbage removal, growth, transportation

Requirements:
Five years of college or Master's degree, including one year of college math

Salary:
$33,000

Woman

Job Type:
Sales Manager

Job:
Manager, retail store

Description:
Supervise other workers; advertising, buying and selling, customer relations

Requirements:
Four years college helpful but not necessary

Salary:
$9,770

Man

Job Type:
Clerical Worker

Job:
Administrative assistant

Description:
Be responsible for routine duties at an office

Requirements:
High school diploma; secretarial training

Salary:
$12,116

Woman

Job Type:
Clerical Worker

Job:
Secretary

Description:
Type, take shorthand, and be responsible for routine duties at an office

Requirements:
High school diploma; secretarial training, including typing and shorthand

Salary:
$11,905

Man

Job Type:
Professional and Technical Worker

Job:
College professor

Description:
Teach college courses in a particular subject

Requirements:
Doctoral degree; teaching experience; published articles and books

Salary:
$25,200

Woman

Job Type:
Clerical Worker

Job:
File clerk

Description:
Label, store, update, and collect information in files

Requirements:
High school diploma; typing and good knowledge of English

Salary:
$9,828

Man

Job Type:
Professional and Technical Worker

Job:
Agricultural engineer

Description:
Design machinery and equipment, and improve ways to grow food

Requirements:
Master's degree in engineering (including math courses)

Salary:
$22,900

Woman

Job Type:
Clerical Worker

Job:
Bank teller

Description:
Handle deposits and withdrawals from accounts

Requirements:
High school diploma; clerical skills; some math

Salary:
$9,776

Man

Job Type:
Craft and Kindred

Job:
Jeweler

Description:
Design jewelry, do stone setting and engraving

Requirements:
High school diploma; four years apprenticeship

Salary:
$13,000

Woman

Job Type:
Service Worker

Job:
Household worker

Description:
Clean house, cook meals, help care for children

Requirements:
Experience and ability to cook and clean; courses in home economics helpful

Salary:
$5,408

Man

Job Type:
Craft and Kindred

Job:
Maintenance electrician

Description:
Keep lights, generators, and other electrical equipment in good working order

Requirements:
Four years apprenticeship

Salary:
$16,640

Woman

Job Type:
Sales Worker

Job:
Retail sales worker

Description:
Sell products, write receipts, receive payment and make change

Requirements:
High school diploma; courses in merchandising, accounting, math

Salary:
$8,008

Man

Job Type:
Craft and Kindred

Job:
Construction inspector

Description:
Inspect building construction, electrical and mechanical works, or public works

Requirements:
Two years of junior college with some courses in math

Salary:
$16,300

Woman

Job Type:
Craft and Kindred

Job:
Sewing machine operator

Description:
Sew clothes by machine in a garment factory

Requirements:
Courses in sewing; high school diploma unnecessary

Salary:
$8,112

Man

Job Type:
Service Worker

Job:
Chef

Description:
Prepare meals and supervise kitchen staff

Requirements:
Courses in business math and food preparation; experience as a cook

Salary:
$16,640

Woman

Job Type:
Service Worker

Job:
Food- counter worker

Description:
Serve customers in cafeterias and fast-food restaurants

Requirements:
High school diploma unnecessary but must be good in math

Salary:
$8,632

Man

Job Type:
Sales Worker

Job:
Retail sales worker

Description:
Sell products, write receipts, receive payments, and make change

Requirements:
High school diploma; courses in merchandising, accounting, math

Salary:
$11,908

Woman

Job Type:
Service Worker

Job:
Social service aide

Description:
Help social workers and people who need aid from social agencies

Requirements:
Two years of junior college

Salary:
$8,944

Man

Job Type:
Sales Worker

Job:
Insurance agent

Description:
Sell insurance policies and help customers plan the use of their money

Requirements:
College degree preferred, with courses in accounting, finance, insurance, and math

Salary:
$20,904 (could be higher, depending on policies sold)

Woman

Job Type:
Service Worker

Job:
Licensed practical nurse

Description:
Help registered nurses and doctors care for patients

Requirements:
Training as a practical nurse; high school diploma preferred

Salary:
$12,500

Part III

Your Future

Lesson 16: Deciding to Plan

Activity A (discussion): Thinking about economic problems

Our culture is changing in many ways. Some of these changes have caused problems for women and minority groups. Here are some examples of problems:

- The fastest-growing poverty group today is women. Two out of three Americans whose income is below the poverty level are women.
- Women rarely get retirement payments. Only one in twenty retired women gets a retirement payment.
- Women make 60 cents in salary for every dollar a man makes. Eighty percent of all working women are in the lowest-paying jobs.
- Nine out of ten women will have to work sometime during their lives.
- Less than 15 percent of all families in America still have a husband who works and a wife who stays home with the children.

A-1 If you are a girl, how can you keep the first three problems from becoming true about yourself?

A-2 Why is it important to know about the last two problems?

Activity B: How did they end up this way?

Read the following story by yourself or with your class.

A Change in Plans

Sonia is 21 years old. After looking for a job for six months, she finally found one last month. She is a clerk typist in an office.

Sonia is asking herself a question: How did I end up working here? She certainly had not planned it this way. Her teenage dreams had included a husband, a baby, and a nice house. She had not thought she would have to work.

In middle school, Sonia had been a very good student. She liked math and science and planned to go to college. She thought that perhaps she would become an engineer or a laboratory technician. She was fascinated by what she had heard about both careers.

Her dreams changed in high school, when she met Tim. Tim had dreams of the future, too. He wanted to be a professional basketball player. Tim and Sonia began dating. Sonia's dreams about becoming an engineer faded. She began to think of life with Tim. She didn't take as much math and science in high school as she had planned.

As they neared graduation, Sonia and Tim decided to get married right away. Sonia would not go to college. Instead, she would stay home and take care of the housework while Tim got a job.

Tim still wanted to be a basketball player. However, he found that the competition—even for a good player like him—was very great. No professional team wanted him straight out of high school, and he wasn't interested in college. The only job he could find was working in a warehouse.

At first, they had been happy, even though they did not have much money. A few months later, Sonia became pregnant and Tim lost his job. The strain of not having money and of planning for a baby at the same time was too much. Tim and Sonia began arguing with each other. Soon they were divorced.

Even after the divorce, Sonia was not frightened about the future. She knew that Tim had found another job. He would give her money to care for the baby. But that did not turn out quite as planned, either. Sonia could not manage on the money Tim was sending her. Before she knew it, she was on welfare. Her income was below poverty level!

Sonia decided she had to get a job. But she had not prepared to work. She had no skills except typing. That's how she ended up in the clerk typist job.

Sonia has now worked at the office for a month. She dislikes her job. It is boring, and she feels that she deserves a much better job. She has decided to go to night school to increase her skills.

Tim is also disappointed in his job. But he has not been able to find anything better. The higher-paying jobs require special skills from a vocational-technical school or a college.

Both Sonia and Tim wish they had waited until later to get married. And they wish they had planned their careers more realistically. If they had, they would probably not be in such a mess now.

B-1 Pretend you have suddenly become the head of a family and your income is below poverty level.

a. How do you feel?

b. How did you get into this situation? (Use your imagination.)

c. List some things that happened that you could not control.

d. List some decisions you made that led you into this situation.

e. What could you have done differently to avoid this situation?

B-2 Make a circle graph showing your life plan. Show what activities you will do and for how long. As you make the graph, think carefully about your future. What you think now will affect what you become.

Activity C: Class wrap-up

Discuss your answers for Activity B.

Lesson 17: A Realistic Plan

Activity A:
Planning a career

Believe it or not, someday soon you will be an adult. If you plan your future carefully, you can have an interesting, full life.

"What kind of planning?" you may ask. Well, how much money do you want to make? Where do you want to live? Do you want to know many people? What kind of people? Do you want to live in the woods, on a farm, or in the city? What kind of car do you want--a big, comfortable gas guzzler or a small economy car? Do you want to marry? If so, when? Do you want to marry early, or do you want a good education first? What kind of job do you want?

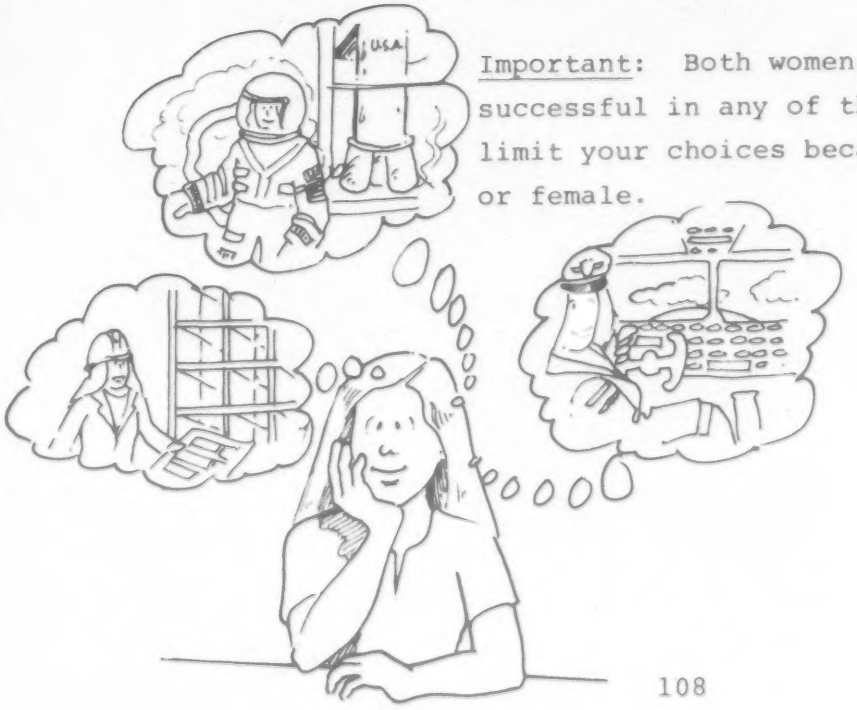
Chances are that you don't know what career you want, or how much money you want to make. But you have to start thinking about your life. You'll be much happier if you plan for it now. No excuses! If you work toward your goals, you can reach them.

In this lesson, you will have the opportunity to think about who you are and what you want to become. As you do the activities, remember the following things:

- Your plan for the future must be realistic. For example, it is realistic to plan to be an accountant in the 1980s and 1990s. There will be many accounting jobs open in these years.

- Your plan must be good for you. The job you plan for should provide the amount of money you need or want. It should also be enjoyable.

To help you think about some careers, read the next section. It provides some information about various jobs that will be available in the 1980s and 1990s.



Important: Both women and men can be successful in any of these jobs. Don't limit your choices because you are a male or female.

Career Information*

Accountants

They keep the financial records of a business. They are needed because managers depend more and more on dollars-and-cents information.

Educational background: Degree in accounting

Starting salary: $15,100

After several years: $18,400 to $31,900

Chief accountant: $28,300 to $50,000

Administrative Support Occupations, including Clerical

Examples include airline reservation clerks, bank tellers, office, stock, and postal clerks, secretaries, receptionists, bookkeepers, credit representatives, claims adjusters, teacher's aides, telephone operators, mail carriers, and typists.

Educational background: High school diploma usually required. For most jobs, some math. Other requirements depend on specific job duties. On-the-job training may be provided.

Starting salary: $9,000 to $18,000

After several years: $11,500 to $21,500

*Source: U.S. Department of Labor, Bureau of Labor Statistics; *Occupational Outlook Handbook* 82-83. U.S. Department of Labor, Bureau of Labor Statistics.

Advertising workers

They do writing, research, and sales work. There are many jobs in large cities such as Los Angeles, New York City, and Chicago.

Educational background: Degree in English, advertising, or journalism

Starting salary: $10,000 to $18,000

After several years: $18,000 to $25,000

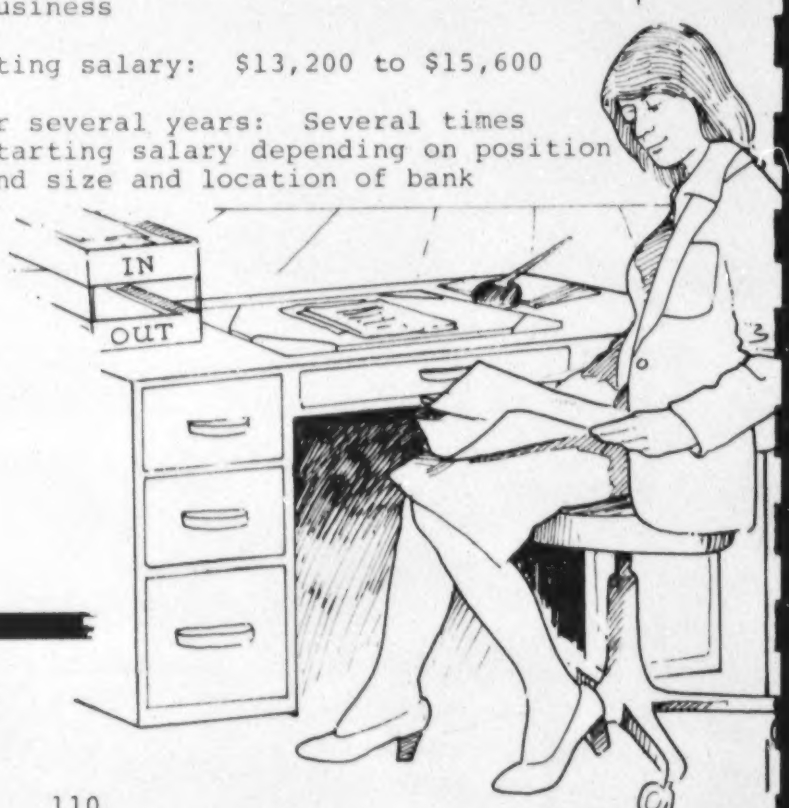
Bank officers and managers

They supervise workers in banks, give advice to individuals and businesses, and take part in community projects.

Educational background: Degree in business

Starting salary: $13,200 to $15,600

After several years: Several times starting salary depending on position and size and location of bank



Computer programmers

They write programs for computers. Many jobs are available in this area.

Educational background: Degree in computer programming

Starting salary: $13,000 to $15,600

After several years: $24,440 to $26,000

Engineers

Some engineers work in manufacturing companies that produce electronic equipment. Other engineers work in construction or public utilities. Others work as professors or researchers. Also, engineers design factories and work on environmental problems.

Educational background: Degree in engineering

Starting salary: $22,900

After several years: $32,516

Market research workers

They study information about products and the people who buy them. They also interview people to get information that will help companies make decisions about buying and selling.

Educational background: Degree in business, marketing

Starting salary: $12,000 to $17,000

After several years: $27,000

Occupational therapists

They help handicapped adults and children in schools, hospitals, clinics, and camps.

Educational background: Degree in occupational therapy

Starting salary: $16,700

After several years: $19,000 to $23,000

Personnel workers

They are responsible for finding good people to work in a company.

Educational background: Degree in business

Starting salary: $16,100

After several years: $21,000 to $31,600

Directors: $27,719 to $49,730

Police officers

Responsibilities range from controlling traffic to preventing and investigating crimes.

Educational background: High school diploma usually required. Civil service requirements (usually). Some college training may be necessary.

Starting salary: $13,000 to $16,500

After several years: $19,100 to $20,500

Public relations workers

They keep the public informed about the company.

Educational background: Degree in business, writing, or public relations

Starting salary: $10,000 to $13,000

After several years: $29,000

Purchasing agents

They buy services and supplies for the company.

Educational background: Degree in business administration or purchasing

Starting salary: $16,200

After several years: $20,300

Service workers

Examples of these are workers in cleaning service, food service (including chefs and cooks), health service, child care workers, hairdressers and barbers.

Educational background: On-the-job training or one or two years of training in a vocational school or community college

Starting salary: $5,255 to $16,494

After several years: $8,600 to $18,500

Urban and regional planners

They plan urban and rural community growth.

Educational background: Graduate work (2 years) in urban/regional planning

Starting salary: $13,800

After several years: $24,000

Now write a realistic career plan. Use the questions below as a guide. You may choose one of the careers described in this lesson or think of another one.

A-1 What do you consider to be your strong points (in personality and skills)?

A-2 What activities do you enjoy the most?

A-3 What are your values?

A-4 Do you like to make decisions?

A-5 What two or three occupations interest you?

A-6 Write an advantage and disadvantage of each occupation. Think of what the job offers in terms of money, travel opportunities, chances to meet people, responsibility, and so on.

A-7 Which occupation interests you the most? Why?

A-8 How can you achieve this career?

a. What skills or abilities do you need?

b. How will you obtain these skills?

c. What other actions must you take to achieve this career? (Think about high school courses, marriage plans, money, and so on.)

A-9 What will you gain if you choose this career?

A-10 What will you give up if you choose this career?

A-11 What people (now or in the future) might encourage you to prepare for this career?

A-12 What people (now or in the future) might discourage you?

Activity B:
Writing a personal career plan

Using the answers to A-1 through A-12, write a short career plan. Include:

- The career you want
- Why you want it
- How you plan to achieve it

Read your plan to the class.

Lesson 18: Changing Your Feelings about Math

Activity A: Learning to like math

Here are some reasons one student said she was afraid of math.

- Because it is like a foreign language
- Because I feel stupid in math class
- Because I'm not good at math

Can people who don't like math change their feelings about math?

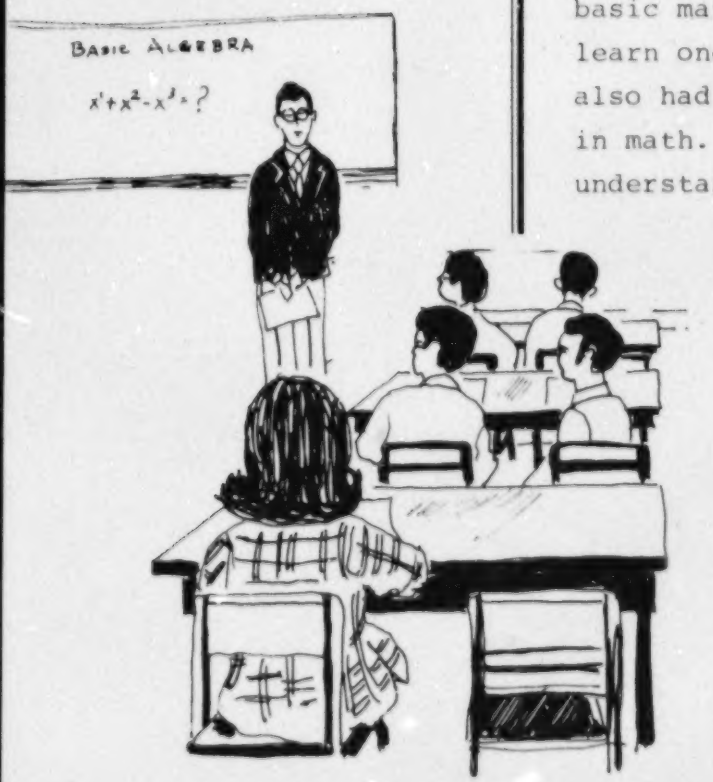
To find out, read the following story.

Clarissa

Clarissa had just begun to see the importance of math. She used it in doing many basic things, such as planning how to spend her allowance. She also realized that the careers in which she was interested required some math.

Clarissa did not enjoy math very much. In fact, she had either daydreamed through all of her math classes or missed them completely. But now she decided to change all that and learn some math.

Clarissa began by paying close attention in class the next week. But she still couldn't understand what was going on. She was a little frightened but still determined to learn. She wondered where she should begin. Perhaps her aunt Pearl, who was an engineer, could help. Clarissa went to see her. She gave Clarissa some basic math books and showed her how to learn one step at a time. Clarissa also had a friend, Jerry, who was good in math. She asked Jerry to help her understand math.



Slowly Clarissa became more at ease with math. Each time she solved another math problem, she felt a sense of excitement and pride. Some of her classmates began asking Clarissa to explain math to them. Success at math felt so much better than failure. Clarissa promised herself she would continue to learn new things about math.

Now form a group with three or four other students. Discuss the questions below. Choose a group recorder to write your group's answers.

A-1 List suggestions that could help to change a person's negative attitude toward math.

A-2 What facts about the usefulness of math might help someone change her or his attitude toward math?

A-3 What things can parents, teachers, and friends do to help girls feel that math is for females as well as males?

Activity B:
How do you feel?

B-1 Has this unit made any differences in your feelings about math? If so, how?

B-2 Have you changed your plans about how much math you are going to take in high school? If so, how?

B-3 Has this unit made a difference in your thoughts about a career for yourself? If so, how?

Activity C:
Class wrap-up

C-1 Discuss your answers for Activities A and B.

C-2 Discuss the careers you chose in Lesson 17. Compare the careers boys chose with the careers girls chose. Do girls feel they have as many choices as boys have? What factors may discourage girls from taking math in high school or preparing for careers in college?